SYSTRON DONNER

A THORN EMI company

SYSTRON DONNER
Member THORN EMI Group

MODEL VP15-42 S7025

INSTRUMENT DIVISION

OPERATING AND SERVICE MANUAL

The VP15-42 S7025 Power Supply is similar to the VP15-85MOV as described in the enclosed manual with Special Modification S7025 added.

Special Modification S7025 consist of:

1. Input volts to 208,220,230 and 235 Vac ±10% @50/60 Hz.
2. Temperature Range: 25 - 50° C.
3. Output volts: 14- 16V. Set to 15.0V.
4. Current Mode: 18A min; 55A max.
5. Overvoltage set to: 18V.
6. Overload Protection set to: 48A.
7. See Parts Lists 065144.
8. See Schematic D124170 for circuit description.

2727 Systron Drive • Concord, California 94518 • U.S.A.
Tel: (415) 676-5000 • TWX: 910-481-9479 • Cable: SYSTRON DONNER
FSCM No. 52542

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*-DEVIATION FROM STANDARD VP 15-85 MOV

ITEM NO.	LTR	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT CODE	ISS. QTY	SHT QTY
1		065144	SHIPPING ASS'Y		X	X		
3	D		SCHEMATIC	D-124170	1	R		
4	A		SPECIAL TEST DATA	A-1298	1	R		
6	A	PD27816	FRONT PANEL ASS'Y		1	2		
7	D	065656	" " FINISH		1	2		
8	B	06507102	METER ASS'Y 20V	M102	1	2		
9	B	0650251	METER MVMT 1mA 77Ω		1	1		
10		117114	DIAL BLANK	B-065071	1	1		
11	B	065048	PC BD (METER MULTIPLIER)		1	2		
12		117123	POT. 1T W.W. 2K	R401	1	1		
13		117126	RES. 19.1K	R402	1	1		
14		103962	HEX NUT		2	1		
15	A	06507901	METER ASS'Y 50A	M101	1	2		
16	B	0650251	METER MVMT 1mA 77Ω		1	1		
17		117114	DIAL BLANK	B-065079	1	1		
18		085420	NAME-PLATE		1	1		
19		600164	POT. 1K-2W	R133	1	1		
20		116650	CIRCUIT BRKR 15A	CB1	1	1		
21		770020	PILOT LAMP	DS101	1	1		
22		840220	SHAFT LOCK		1	1		
23		T920190	TIP JACK BLACK		1	1		
24		T920260	" " RED		1	1		
25		T920258	" " WHITE		1	1		
26		T920010	HANDLES		2	1		
27		106416	CAP. .1μf-600V	C113	1	1		
28			FRONT PANEL WIRING	PD28273	1	R		
			RES					

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER | PREP DATE | SYSTRON DONNER CORPORATION

CHK'D

MAT. DUE | APP'D

S/U REQ.

S/U COMP

SHIPPING ASS'Y
VP 15-42
S7025

DRAWING NO.

SIZE | SIZE | DWG NO. | REV

P 065144

SHEET

REVISIONS DESCRIPTION

✳- DEVIATION FROM STANDARD VP15-85-MOV

ITEM NO.	EC	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SH QT
34	B	PD27817	MAIN CHASSIS ASSY		1	2		
35	D	065145	" "		1	2		
36	A	504315	TRANSFORMER	T101	1	2		
37		504085	CHOKE	L101	1	2		
38		106664	FAN	B101	1	1		
39	C	T111894	SHROUD		1	2		
40		102776	4-40 x 3/8 NYLON SCREWS		2	R		
41		T900111	CAP. BRKT		1	1		
42	C	T109932	INSULATOR PLATE		1	2		
43		T990400	NYLON NUT		3	R		
44		840192	RUBBER FEET		4	1		
45	C	T109902	BUSS		1	2		
46	C	T109462	" (POS. OUTPUT)		1	2		
47	C	T109452	" (NEG. OUTPUT)		1	2		
48	C	T111852	" (DIODE POS)		1	2		
49	C	124322	SHUNT .0024Ω	R134	1	2		
50		117333	P.C. BOARD SUPPORT		4	1		
51	D	T109272	CAP. CLAMP		1	2		
52		820378	CAP. 23,800µf	C105, 106,	6	1		
53				107, 108,		R		
54				109, 110		R		
55		800304	1µf - 250V	C104	1	1		
56		800325	2.2µf - 250V	C103	1	1		
57		820359	17500µf - 20V	C112	1	1		
58								
59								
60		057020	BRACKET BLOWER		2	1		
64	B	PD28286	SUB-CHASSIS ASS'Y		1	2		
65	D	T109942	" "		1	2		
66	B	T100712	CAP. CLAMP		1	1		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDEN
				52542

PLANNER | PREP DATE | CHK'D | APP'D | MAT. DUE | B/O REC. | B/O COMP.

SYSTRON DONNER CORPORATION

SHIPPING ASSY
IP 15-42
S7025

DRAWING NO.
REFERENCE PART NO.
— P 065144

* - DEVIATION FROM STANDARD VP15-85.MOV

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
			SUB-CHASSIS ASSY (CONT.D)		X	X		
68		820403	CAP. 35,000 mf-20V	C111	1	1		
69		860055	CERAMIC STANDOFF.		2	1		
70		T900003	ANGLE BRACKET		2	1		
71		T990405	NYLON NUT		4	R		
72								
73	B	T109862	BUSS EMITTER CONN.		1	2		
74								
75								
79	B	PD27812	HEATSINK ASS'Y #1		1	2		
80	D	T109912	HEATSINK		1	2		
81	C	T109882	BUSS		1	2		
82		700088	TRANSISTOR 2N6258	Q120, 121,	8	1		
83			S/A Q120	123, 124,		R		
84			S/A Q120	125, 127,		R		
85			S/A Q120	128, 130		R		
86		830101	TRANSISTOR SOCKET		8	1		
87		630027	RES. 0.3Ω-5W-3%	R120, 121,	8	1		
88			S/A R120	123, 124,		R		
89			S/A R120	125, 127,		R		
90			S/A R120	128, 130		R		
91		T990405	NYLON NUT		1	R		
92			HEATSINK #1 WIRING	PD27818	1	R		
96	B	PD27813	HEATSINK ASS'Y #2		1	2		
97	D	T109912	HEATSINK		1	2		
98	C	T109882	BUSS		1	2		
99		830101	TRANSISTOR SOCKET		7	1		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER | PREP DATE | SYSTRON DONNER CORPORATION

CHK'D

MAT. DCE | APP'D

ENG REL

SHIPPING ASSY
VP 15-42
57025

DRAWING NO.
SIZE | PART NO. | REV
— P 065144

ENG COMP

DESCRIPTION

✱ - DEVIATION FROM STANDARD VP15-85-MOV

ITEM NO.	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SH QT
		HEATSINK ASSY #2 (CONT)		X	X		
101	700088	TRANSISTOR, 2N6258	Q108, 109,	7	1		
102		S/A Q108	110, 111,		R		
103		S/A Q108	114, 116,		R		
104		S/A Q108	118		R		
105	725057	DIODE MR1120	CR101, 102	2	1		
106	630027	RES. 0.3Ω-5W-3%	R108, 109,	7	1		
107		S/A R108	110, 111,		R		
108		S/A R108	114, 116,		R		
109		S/A R108	118		R		
110	T990405	NYLON NUT		1	R		
111A		HEATSINK #2 WIRING	PD27819	1	R		
112	116969	LUG		1	R		
113	800185	CAP. .1μf-250V	C101, 102	2	1		
114	640190	RES 10Ω 2W 10%	R132	1	1		
115B	PD27814	HEATSINK ASS'Y #3		1	2		
116D	T109922	HEATSINK		1	2		
117C	T109882	BUSS		1	2		
118	725089	DIODE,	CR103, 104	2	1		
119	720335	DIODE, IN1184A	CR108	1	1		
120	700196	TRANSISTOR, 2N4912	Q103	1	1		
121	705071	2N3447	Q101, 102,	2	1		
122	700088	2N6258	Q105, 107	2	1		
123	830101	TRANSISTOR SOCKET		4	1		
124	830103	" "		1	1		
125	880093	THERMAL SWITCH	S101	1	1		
126	640037	RES. .22Ω-2W-3%	R101, 102	2	1		
✱127	630027	0.3Ω-5W-3%	R105, 107	2	1		
128	101467	1K-½W-10%	R103	1	1		
129	101498	100Ω-½W-10%	R131	1	1		
130	860070	STANDOFF #6		2	1		
131	T990405	NYLON NUT		1	R		
132		HEATSINK #3 WIRING	PD27820	1	R		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE ID 5254
PLANNER	PREP DATE	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'Y VP15-42 S7025		
MAT. DUE	APP'D			
B/U REQ.		DRAWING NO.		
B/U COMP		RELEASE PART NO. — P 065144		
	USED ON	SHEET 4 OF 7		

REVISIONS
BY DESCRIPTION

*-DEVIATION FROM STANDARD VP15-85 MOV

ITEM NO.	SFX	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
37	A	PD23862	DIODE BRKT ASS'Y		1	2		
38	C	T109442	DIODE BRKT		1	2		
39		720335	DIODE, 41HF10	CR107	1	1		
40		720047	SCR, 110A-50V	CR106	1	1		
41								
42								
43	A		DIODE BRKT/SHUNT WIRING	PD23861	1	R		
47	A	PD27815	REAR CHASSIS ASS'Y		1	2		
48	B	T109472	OUTPUT INSULATOR		1	2		
49	B	081463	COVER AC		1	2		
50		850039	BARRIER STRIP		1	1		
51		851303	" "		1	1		
52		860100	HEX SPACER 1/2"		2	1		
53		T101040	NAME PLATE		1	R		
54		840217	LINK		4	1		
55	A		REAR CHASSIS WIRING	PD27823	1	R		
56	A	069116	AC DIAL PLATE		1	2		
57		069115	AC INPUT FOILCAL		1	1		
59	C	PD27810	P.C. BOARD ASS'Y		1	2		
60	D	T112256	" "		1	2		
61		100063	CAP. 10μf-25V	C12	1	1		
62		810060	35μf-25V	C5, C6	2	1		
63		102593	100μf-50V	C1	1	1		
64		821007	68μf-25V	C13	1	1		
65		821006	68μf-15V	C11	1	1		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT 52542
PLANNER	PREP DATE	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'Y VP 15-42 S7025		
MAT. DUE	APP'D			
B/U REQ.		DRAWING NO.		
B/U COMP		AGE SIZE P	PART NO. 065144	REV
		SHEET 3 OF 7		

DESCRIPTION

*- DEVIATION FROM STANDARD VP15-85-MOV

ITEM NO.	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
		P.C. BOARD ASS'Y (CONT)		X	X		
167	100134	CAP. .05 μf-200V	C7	1	1		
168		.					
169	800090	.01μf-600V	C3, C8, C9	3	1		
170	800002	470pf	C4	1	1		
174		DIODE, DELETE	CR5				
175	100387	IN753A	CR4	1	1		
176	100413	IN5395	CR1, 2, 6, 7,	6	1		
177		S/A CR1	12, 13		R		
178	720410	IN4741A	CR3	1	1		
179	720440	IN4148	CR11	1	1		
180	100378	IN751A	CR10, CR8	2	1		
184	025756	IC, MC1723	A1	1	1		
187	106587	TRANSISTOR, 2N2219A	Q1	1	1		
190	741001	SCR, 2N4990	CR9	1	1		
193	117188	RES. POT. 100Ω-½W	R11, 16, 21,	4	1		
194		S/A R11	24		R		
195	600133	POT. 500Ω	R2, R3	2	1		
196							
197	106012	2.2Ω-½W-5%	R14, 8	2	1		
198	101454	2.2K-½W-5%	R12	1	1		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDE
				52542

PLANNER | PREP | DATE | SYSTRON DONNER CORPORATION

CHK'D | SHIPPING ASS'Y

MAT. DUE | APP'D | VP 15-42

S7025

B/U REQ.

DRAWING NO.

REF | SIZE | PART NO.

P 965144

B/U COMP

REVISIONS DESCRIPTION

✳ - DEVIATION FROM STANDARD VP15-85 MOV

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
			P.C. BOARD ASSY (CONT'D)		X	X		
00		101607	RES. 220Ω - ½W	R30	1	1		
01		101454	2.2K - ½W	R32	1	1		
02		101467	1K - ½W	R23, 29	2	1		
03		101511	4.7K - ½W	R27, 31	2	1		
04		101510	6.8K - ½W	R28	1	1		
05		620402	1.96K - ½W - 1%	R7	1	1		
06		102251	1.50K ½W - 1%	R4	1	1		
07		620582	5.62K - ½W - 1%	R5	1	1		
08		620534	4.64K - ½W - 1%	R6	1	1		
09		640300	50Ω - 10W - 10%	R17, 18	2	1		
10		640350	100Ω - 5W - 5%	R19	1	1		
11		101655	22Ω - 2W	R20	1	1		
12		101459	1.5K - ½W - 5%	R22	1	1		
13		640440	470Ω - 2W	R1	1	1		
14			#20 AWG JUMPER	R13	1	R		
15		630450	2.5K - 3W - 3%	R15	1	1		
16		611100	2.2 MEG ½W 10%	R26	1	1		
18		T942298	AC-DC HARNESS		1	2		
19		PD27811	" " " LIST			R		
20		SP541	" " " LAYOUT			R		
22		PD24413	JUMPER LIST		1	2		
24			FAN WIRING	PD23772	1	R		
25			XFORMER WIRING	PD27821	1	R		
			CHOKE WIRING	PD27822	1	R		
27		PD23778	TOP COVER ASSY		1	2		
28		T115384	" "		1	2		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER | PREP | DATE | SYSTRON DONNER CORPORATION

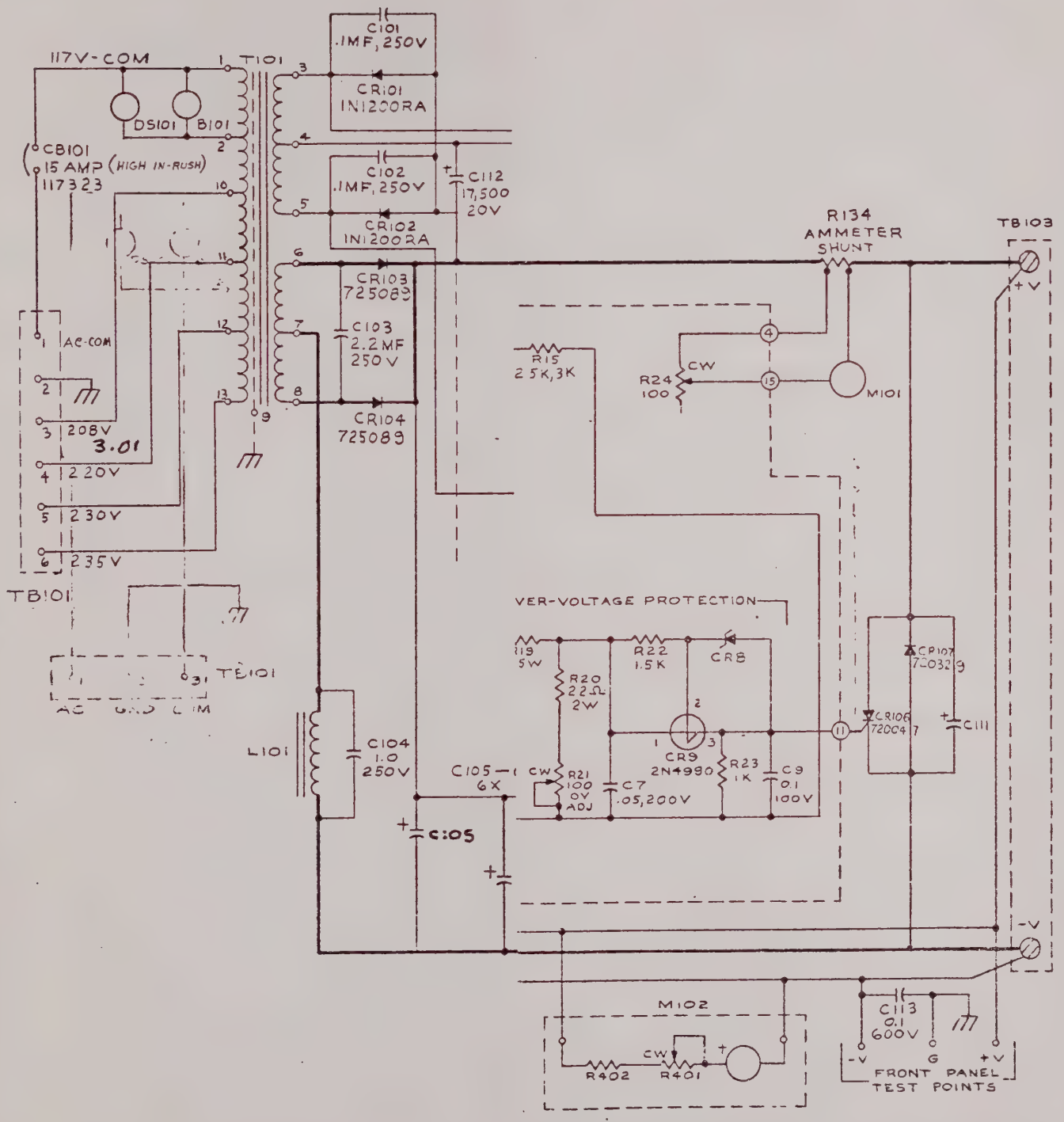
CHK'D | APP'D | MAT. DUE | S/U REQ. | S/U COMP

SHIPPING ASSY
VP 15-42
S7025

DRAWING NO.
065144

REVISIONS
DESCRIPTION

USED ON | SHEET



REV	DESCRIPTION	ENG NO.	P.O. NO	DATE	APP BY
A	CR108 WAS P/N 720433		V5120	6-11-73	RB

ITEM NO	QTY	PART NUMBER	DESCRIPTION	SCHEMATIC REF NO

LIST OF MATERIALS

VP13-80 S6531	504290	504082	23,600 40V	NOT USED	27	.2 5W	.0015 T1.09482
VP15-42 S7025	504315	504085	23,600 40V	NOT USED	17	.3 5W	.0024 1.24322
VP20-40 S7026	504316	504085	0,500 75V	2500 .5W	17	.3 5W	.00064 .24322
MODEL	T101	L101	C105-C110	R135			R134 SHUNT

SYSTRON DONNER CORPORATION CONCORD CALIFORNIA

CODE IDENT 52542

MODEL
VP13-80-S6531
VP15-42-S7025
VP20-40-S7026

SCHEMATIC

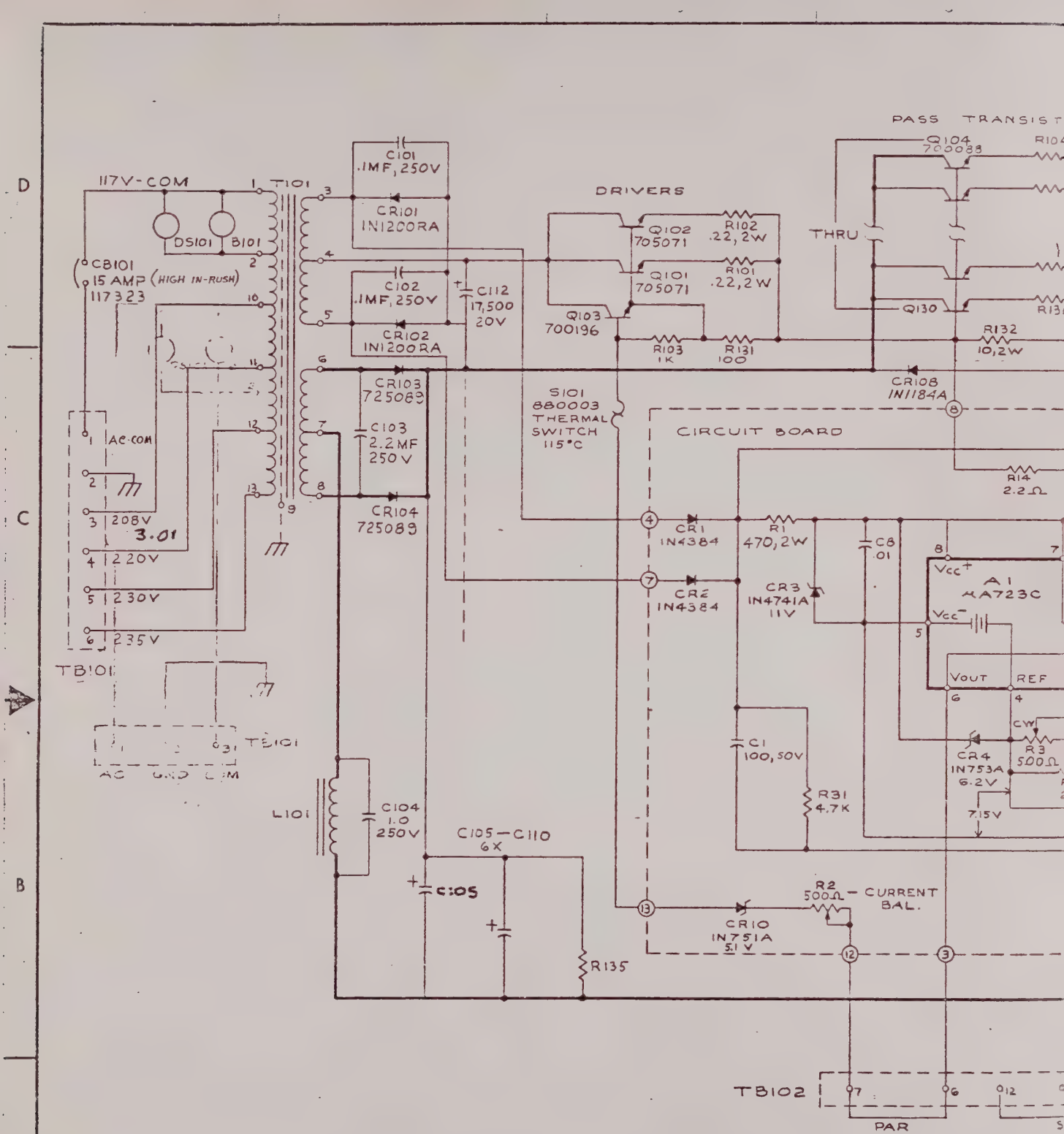
DRAWING NO

SIZE D

DO NOT SCALE DRAWING

SHEET 1 OF 1

12/4/73



MODEL	T101	L101	C105-C110	R135	STYLE VALUE R104-R133 3.3 R104-R130 3	R134 SHUNT	M101	M102	C111
VP13-80 S6531	504290	504082	23,800 40V	NOT USED	27	.2 5W	.0015 T109482	100A C65030-01	15V 065070-02	35,000 20V
VP15-42 S7025	504315	504085	23,800 40V	NOT USED	17	.3 5W	.0024 124322	50A 065079-01	20V 065071-02	35,000 20V
VP20-40 S7026	504316	504085	10,500 75V	2000 5W	17	.3 5W	.0024 124322	50A 065079-01	30V 065085-02	20,000 35V

POWER COMPONENT TABLE

MODEL	R4	R5	R12
VP13-80 S6531	1.62K 1%	4.99K 1%	2.2K
VP15-42 S7025	1.50K 1%	5.62K 1%	2.2K
VP20-40 S7026	1.27K 1%	6.19K 1%	3.3K

CIRCUIT BOARD COMP

REVISIONS					
REV	DESCRIPTION	ENG NO	P.O. NO	DATE	APP'D
A	CR108 WAS P/N 720423		15120	6-11-73	[illegible]

NOTES:
1. UNLESS OTHERWISE SPECIFIED.
ALL RESISTOR ARE 1/2 WATT, ± 5%
RESISTOR VALUES ARE EXPRESSED IN OHMS.
CAPACITANCE VALUES ARE EXPRESSED IN MICROFARADS
2. * SELECT AT TEST.

THRU

R134 AMMETER SHUNT

TB103

+V

-V

R15 2.5K, 3K

R24 100 CW

M101

R16 100 CW

R11 100 ADJUST I LIMIT CW

R28 6.8K

C11 68/15V

R30 220

R12

Q1 2N2219A

R13 *

CR5

C3 .01

R29 1K

R27 4.7K

R8 2.2Ω

COMP

C4 470pf

CR12 IN4384

CR13 IN4384

OVER-VOLTAGE PROTECTION

CR11 IN4148

R4

R5

C12 10/25V

R6 [illegible]K, 1%

2.2V

R7 1.96K, 1%

+V

R19 100, 5W

R22 1.5K

CR8

R17

R18

C13

R20 22Ω 2W

CR9 2N4990

R23 1K

C9 0.1 100V

CR10 720047

CR107 720329

C111

R21 100 0V ADJ CW

C7 .05, 200V

CR6 IN4384

C5 35/25V

CR7 IN4384

C6 35/25V

VOLT. ADJ.

R133 1K, 2W CW

M102

R402

R401 CW

C113 0.1 600V

-V G +V

FRONT PANEL TEST POINTS

010 09 08 5 4 3 2 01

ARES

+V +S RVP -S -V

0	IN751A	5.1V	68 25W
0	IN751A	5.1V	68 25V
0	NOT	USED	30 50V
7	CR8		C13
18			

EN— TABLE

PROPRIETARY DATA

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ITEM NO.	QTY	PART NUMBER	DESCRIPTION	SCHEMATIC REF NO

LIST OF MATERIALS

DRAWN	J. BROWN 7-6-73	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DECIMAL TOLERANCE .XX ±.01 .XXX ±.005 ANGLES ±1°	SYSTRON DONNER CORPORATION CONCORD CALIFORNIA
CHECK	DATE		
ELECT	DATE		
MECH	DATE		
PROJECT	DATE		
	DATE		

CODE IDENT 52542

MODEL
VP3-80-S6531
VP13-42-S7025
VP20-40-S7026
SCHEMATIC

USED ON	NEXT ASSY
APPLICATION	

CALL

DO NOT SCALE DRAWING

SH 1 OF 1

MATERIAL

DRAWING NO.

REF	SIZE	PART NO	REV
	D	24170	A

A

INSTRUCTION MANUAL

This manual describes the VPH ValuPower Half Rack Series Power Supplies. It contains information of the following:

Model VPH5-60M OV
Model VPH12-35M OV
Model VPH15-31M OV

Model VPH24-22M OV
Model VPH 28-19M OV

Model VPHD15-13M OV

VPH SERIES
VALUPOWER HALF RACK POWER SUPPLIES

MODEL NO.

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SYSTRON DONNER CORPORATION

CONCORD INSTRUMENT DIVISION
10 Systron Drive • Concord, California 94518 • U.S.A.
Tel: (415) 676-5000 • TWX: 910-481-9479 • Cable: SYSTRONDONNER
FSCM No. 52542

Printed in U.S.A.

SYSTRON DONNER
Member THORN EMI Group

TEST & MEASUREMENT GROUP OF SYSTRON DONNER WARRANTY POLICY

I Warranty

The Test & Measurement Group of Systron Donner warrants that at the time of shipment the products manufactured by Systron Donner's T & M Group and sold hereunder will be free from defects in material and workmanship and will conform to the specifications furnished by or approved in writing by Systron Donner's T & M Group.

II Warranty

A **The warranty period for products published in our latest product catalog will be one year from the date of shipment. This warranty is extended only to the original buyer.**

B The warranty period for products published in prior catalog, will be 90 days from the date of shipment.

C The warranty period for modified standard products, custom products, or new spare part assemblies will be 90 days from the date of shipment.

D The warranty period for systems or assemblies of miscellaneous components and products will be limited to the warranty for the stand alone component or instrument. The system itself is not guaranteed unless a specific installation and service agreement has been negotiated between Systron Donner and the customer. In this latter case, the warranty period will be 30 days after the installation of the system while the various portions of the system will be limited to the normal component or instrument stand alone warranty, and for non Systron Donner material within the system that is furnished by Systron Donner the warranty will be limited to the supplier's normal warranty.

III Warranty Adjustments

A If any defect within this warranty appears, Purchaser shall notify Seller immediately

B Systron Donner's T & M Group agrees to repair or furnish a replacement for, but not install, any product which, within the standard warranty shall, upon test and examination by Systron Donner's T & M Group, prove defective within the above warranty period.

C No product will be accepted for return or replacement without the written authorization of Systron Donner's T & M Group. Upon such authorization and in accordance with instructions by Systron Donner's T & M Group, the product will be returned to the original manufacturing location, shipping charges prepaid by Purchaser.

IV Exclusions from Warranty

A The foregoing warranty is in lieu of and excludes all other expressed or implied warranties of merchantability or fitness or otherwise.

B Systron Donner's T & M Group will not be liable for any special or consequential damages or for loss, damages or expense directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with any other equipment or material, or from any other cause.

C The warranty does not extend to any product manufactured by Systron Donner's T & M Group which has been subjected to misuse, neglect, accident, improper installation or to use in violation of instructions furnished by Systron Donner's T & M Group.

D The warranty does not extend to or apply to any unit which has been repaired or altered at any place other than at a Systron Donner T & M Group factory, by persons not expressly approved by Systron Donner's T & M Group, not to any unit, the serial number of which has been removed or defaced or changed.

E This warranty applies to new equipment only and will cover repaired or replacement items only to the extent of the balance remaining of the items original warranty period noted above in Paragraph II.

F All freight charges will be paid for by the Purchaser.

Divisions in the Test & Measurement Group include:
Instrument Division — Concord, CA
ACD Division — Sunnyvale, CA
SD GmbH — Munich, West Germany

January 1982

SYSTRON DONNER
Member THORN EMI Group

INSTRUMENT
DIVISION

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SECTION I
DESCRIPTION

1.1 INTRODUCTION

The ValuPower Half Rack (VPH) Series Power Supplies are flexible and dependable sources of DC power, which can be used to meet a variety of needs. These needs may range in scope from inspection and production testing, to laboratory bench testing, IC and system applications.

The voltage adjustment range makes these units well suited for specific systems applications. The ability to provide power packaged in minimum space with high reliability and performance meets the demands of most systems requirements.

This instruction manual provides general characteristics and specifications, operating procedures, theory of operation, calibration and maintenance, parts lists and related schematics for the ValuPower Half Rack series Power Supplies Models, VPH5-60M OV, VPH12-35M OV, VPH15-31M OV, VPH24-22M OV, VPH28-19M OV and VPHD15-13M OV.

1.2 DESCRIPTION

The VPH Series is a unique innovation in DC power supply technology. It provides high power output with excellent regulation, low ripple, fast response and low output impedance for powering and protecting sensitive IC's and systems.

The VPH Series units are available in five slot range outputs and one dual output model (VPHD15-13M OV) providing ±11.5 to 15.5 Vdc at 13 amps. All units are half rack, 5-1/4" high for bench or rack mounting with suitable adapters.

This series is multi-versatile for use in either multiple output power systems or in lab applications with optional meters and controls.

For multiple output power applications, the VPH Series is compatible with Trygon's RM521 and RAH-2B rack adapters. These rack confiugrations afford the user the opportunity to mix and match smaller units with different ratings providing a complete system power supply with multiple outputs for various power requirements.

1.3 GENERAL FEATURES

This series features UL Design, low noise for IC and Systems applications, extremely low output impedance, unique self-test output indicator lamp, adjustable current limiting, remote sensing and programming, overvoltage protection, no turn on/turn off transients, positive convection cooling and versatile rack and bench mounting capability for multiple output power. Output, sensing and remote programming terminals are located on the rear panel of the unit. The AC power switch, DC "ON" lamp, voltage control, and appropriate optional metering devices are all located on the front panel.

1.3.1 Constant Voltage Model

A constant voltage is maintained across the output terminals at any preset value within the rated slot voltage range, provided that the load does not draw more than either the rated output current or more than the preset limiting current value determined by the top recessed current control setting.

1.3.2 Automatic Foldback Current Limiting

Short circuit protection is provided by the automatic current limiting circuit which limits the maximum output current under all load conditions. The point at which automatic current limiting occurs is variable and may be selected anywhere between 40% of the rated output current and maximum rated output current of the unit. In the event of an overload, the current and voltage foldback into a safe operating region. In the event of a short circuit, the output current is limited to approximately 40% of the rated current.

1.3.3 Remote Programming

Remote Programming is provided in the voltage mode of operation and may be utilized over the entire voltage range of the unit. The scale factor for remote voltage programming is approximately 500 ohms per volt.

1.3.4 Adjustable Overvoltage Protection

Adjustable overvoltage protection (OV) has a special circuitry which prevents the output from exceeding a preset voltage. An external adjustment control recessed in the top cover is provided to vary the point at which the OV circuit will activate. The overvoltage crowbar will latch when an overvoltage condition occurs and must be reset by cycling the AC input power off and on again. The OV protection point should not be set lower than 1 volt above the minimum power supply voltage rating or 5.5 V minimum.

1.4 PRECAUTIONARY MEASURES

1.4.1 Wire Size

To assure proper regulation under all load conditions and to prevent severe distortions of the AC line voltage, it is very important to take into consideration the physical size and current handling capabilities of the input power line. Serious losses in regulation and an increase in ripple may result from underrated or overloaded AC input lines. The maximum AC impedance from the breaker box to the power supply should not exceed 0.5 ohms.

1.4.2 Terminal Post Resistance

All terminals and shorting links serving outputs, sensing and programming must be securely tightened before use. Serious loss of regulation and an increase in ripple can result due to a voltage drop caused by loose terminals and shorting links.

The specifications cited herein for regulation and ripple can be readily attained on every power supply providing the proper method of measurement is employed. The major consideration is that the highly stable meter and oscilloscope, specified in the calibration procedures, must be connected to the sensing terminals and not the load terminals. The reason for this precaution is that the voltage drop between the load terminals and sensing terminals will yeild an inaccurate regulation ripple measurement.

1.5 SPECIFICATIONS

Table 1-1 is a complete list of standard specifications for the ValuPower Half Rack Power Supplies.

TABLE 1-1 SPECIFICATIONS

ELECTRICAL SPECIFICATIONS

Input:	105-132 Vac[1], 57-65 Hz. (200-250 Vac, 47-65 Hz option available)[2].
Output:	Floating; Isolated from ground, 300 Vdc maximum. Internal protection is provided for applied reverse voltage.
Regulation Line:	0.02% for 105-132 Vac line change.
Regulation Load:	0.02% or 5 mV* for no load to full load.
Ripple:	Less than 1 mV RMS; total ripple and noise less than 5 mV p-p +0.05%(to 10 MHz).
Stability:	0.05% +10 mV, for 8 hours after 30 minutes warm-up. Measured at constant line, load and ambient temperature.
Temperature Coefficient (Per°C):	0.02%/°C.
Temperature Range:	-20°C to +71°C.
Temperature Storage:	-55°C to +85°C.
Recovery Time:	50 microseconds to within 30 mV for a $\Delta 1$ change as shown in the table.
High Stability (X Option):	0.03%/8 hours. 0.1%/1000 hours. TC 0.01%/°C.
Overload Protection:	A unique patented automatic non-linear current foldback system is incorporated in these units. It is adjustable from 40% to 100% of rated load and affords maximum protection of the series pass regulator while providing maximum reliability should an overload condition occur. (A minimum short circuit current of 10% will be delivered into any class of load, ensuring proper operation with most non-linear loads).

TABLE 1-1 SPECIFICATIONS (Cont'd)

ELECTRICAL SPECIFICATIONS (Cont'd)	
AC Power Input Protection:	Rear panel mounted fuse.
Remote Programming:	Programmable over rated voltage range. Scale factor approximately 500 ohms/volt.
Remote Sensing:	Maintains rated regulation directly at the load. Maximum line drop 0.5 V per leg is included in voltage range. Internal protection is supplied for open sensing leads.
Voltage Adjustment Range:	Continuously adjustable over rated voltage range. Resolution and settability 0.1%.
UL Approval:	Designed to meet UL Recognized Component Index requirement.
GENERAL & PHYSICAL SPECIFICATIONS	
Design Principle:	Prescision Series Pass Regulation.
Operational Modes:	Constant Voltage with Automatic Current Foldback Protection.
Controls:	
Voltage:	Continuous voltage adjustment, front panel screwdriver locking adjust.
Current:	Top recessed adjustment, 40% to 100%.
Input Power:	Front panel AC ON switch (optional)[3].
Output Power:	Front panel DC output indicator.
OV Adjust:	Top recessed adjustment potentiometer.
Metering (Option)[3]:	
Voltage:	Front panel Voltmeter (meter accuracy ±2%).
Current:	Front panel ammeter (meter accuracy ±2%).
Rear Panel Power Output Terminals:	(TB-3) 1/4-20 heavy duty terminals for +V and -V.
Rear Panel Barrier Strip:	(TB-1) (1) AC; (2) Ground G; (3) AC. (TB (TB-4) (1) Negative Output -V; (2) Negative Sensing -S; (3) Remote Voltage Programming RVP: (4) Positive Sensing +S; (5) Positive Output +V.
Systems Rack Mounting Capability:	VPH units without meters can be mounted in Rack Models RPS-8B, RAH-2B or RQH-3B racks for multiple output power are used where meter option is requested. Rack Model RM521 is used for multiple output systems applications where meters and controls are required, external to the unit.

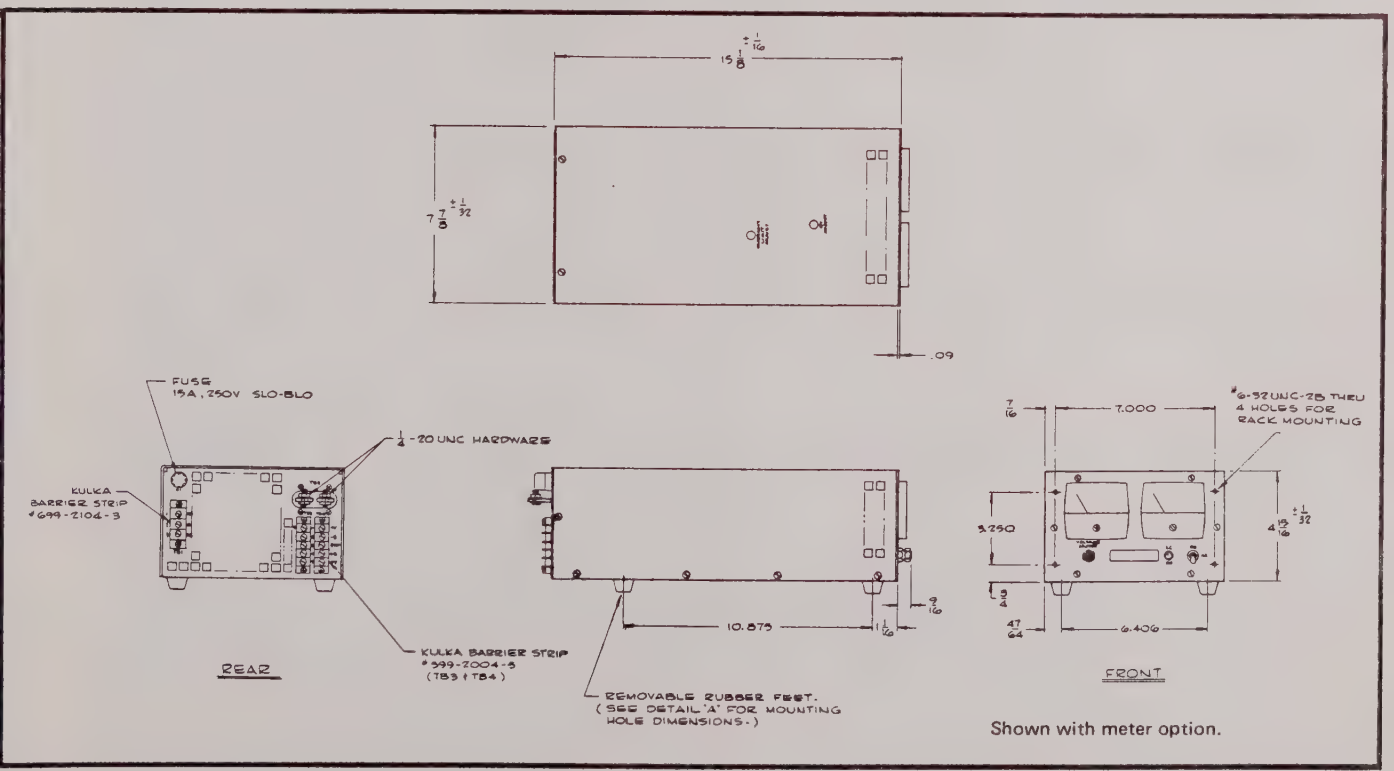
TABLE 1-1 SPECIFICATIONS (Cont'd)

GENERAL & PHYSICAL SPECIFICATIONS (Cont'd)

Overvoltage Protection:	Automatic fast acting, adjustable overvoltage protection available with recessed adjustment.
Dimensions:	5-1/4" x 7-3/4" x 16-1/4".
Weight:	40 lbs.

NOTES: [1]Derate output current 15% for operation above 125 Vac (or 238 Vac).
[2]Derate current 10% or temperature 10 C. Multiply ripply by 2x factor.
[3]When meter option (suffix M) is ordered, unit is provided with four rubber mounting feet for bench use, AC switch and DC output indicator as well as voltage and current meters.

Model	Volts	Max. Amps at Ambient of: 40°C	60°C	71°C	Nominal AC Line Current Rms Amps	Nominal Impedance DC-1 KHz Ohms	Recovery ΔI Amps	Eff* (%)
VPH 5-60 OV**	4.75 to 5.5	60	45	35	8	0.0005	15	40
VPH 12-35	11.0 to 13.0	35	24	20	9	0.001	12	50
VPH 15-31	14.0 to 16.0	31	21	18	9	0.001	10	55
VPH 24-22	23.0 to 26.0	22	15	13	10	0.001	8	57
VPH 28-19	26.0 to 30.0	19	13	11	10	0.001	6	57
VPHD 15-13 (Dual)	±11.5 to 15.5	13	9	7.5	7.5	0.001	4	51



Shown with meter option.

SECTION 2

INSTALLATION AND OPERATION

2.1 MECHANICAL INSTALLATION

When the ValuPower Half Rack series power supply is to be used in a rack configuration, rack adapter RAH-2B may be used for either metered or unmetered models. The RAH-2B will accommodate two VPH units side by side. Rack model RM521 can accommodate VPH units intermixed with other modules as well.

For rack mounting, the four rubber feet are removed before placing unit into the rack adapter. The rubber feet provided on all units allow the power supply to be used as a bench supply.

2.2 ELECTRICAL CONNECTIONS

Input Power

A three-terminal barrier strip mounted on the rear panel provides AC input connections to the unit.

The power handling ability of the AC power lines feeding AC power to the unit must be considered, as serious losses in regulation and substantial increase in ripple may occur as a result of insufficient power capacity of these lines. All AC power line connections must be securely tightened and any movable electric contact surface (such as the wiper arm of a variable transformer) should be kept clear of impedance producing oxide coatings.

Care should be exercised in selecting the proper wire size for the AC input lines. The AC wire size should be sufficient so that the line drop does not exceed a value which will allow the input voltage to drop below the specified lower limit of 105 VAC.

An AWG #16 should be adequate for most short runs of 20 ft. or less. Increase wire size to #14 for up to 50 feet and to #12 for up to 100 feet.

Output, Rear Panel

On single output VPH units, main output is provided on two heavy duty terminals. A second auxilliary terminal block is provided for remote sensing and remote programming.

On dual output VPHD units, the negative output, negative remote sensing and remote programming is provided on one terminal block, with positive output, positive remote sensing, and common voltage return and common remote sensing provided on a second terminal block.

2.3 OPERATING CONFIGURATIONS

The ValuPower series power supplies are designed to operate as highly regulated constant voltage sources with automatic foldback current limiting. There are various operating configurations that can be used by proper application of shorting links

2.3 Continued

and wiring. The following paragraphs describe the various operating configurations and their connections.

Local Voltage Programming (Fig. 2-1)

To adjust the output voltage from the power supply, connect a shorting link across terminals 2 and 3. With this shorting link installed, the voltage adjust control provides adjustment of the output over the rated slot voltage range.

Remote Voltage Programming (Fig. 2-2)

Remote voltage programming is achieved by removing the shorting link from terminals 2 and 3 and substituting a resistive element of proper value across terminals 2 and 3 external to the power supply.

Sensing Connections

Local Sensing (Fig. 2-1)

Local sensing connections are made when rated regulation is not required directly at a remote load.

Connect the load to output studs +V and -V, and ascertain that shorting links are connected between terminals 1 and 2 and 4 and 5.

Remote Sensing (Fig. 2-3)

Remote sensing is used when rated regulation is required at a remote load.

Remove the shorting links between terminals 1 and 2 and 4 and 5. Using a twisted, shielded pair of wires, connect the -S (2) and +S (4) sensing terminals to the load. To prevent damage to the power supply, correct polarity of both the remote sensing and output leads must be observed. The negative remote sensing lead (-S) and negative output lead (-V) must be connected to one side of the load and the positive remote sensing lead (+S) and positive output lead (+V) connected to the other side of the load. The shield should be grounded at the power supply end of the cable.

2.4 CONTROLS

Front Panel

AC ON - switch controls power
Voltage Adjust - Potentiometer, Adjusts voltage output.

Top Cover (Recessed Controls)

Current Limit - Potentiometer adjust current limiting point
OV Adjust (option) potentiometer adjust overvoltage protection point in units having this optional feature.

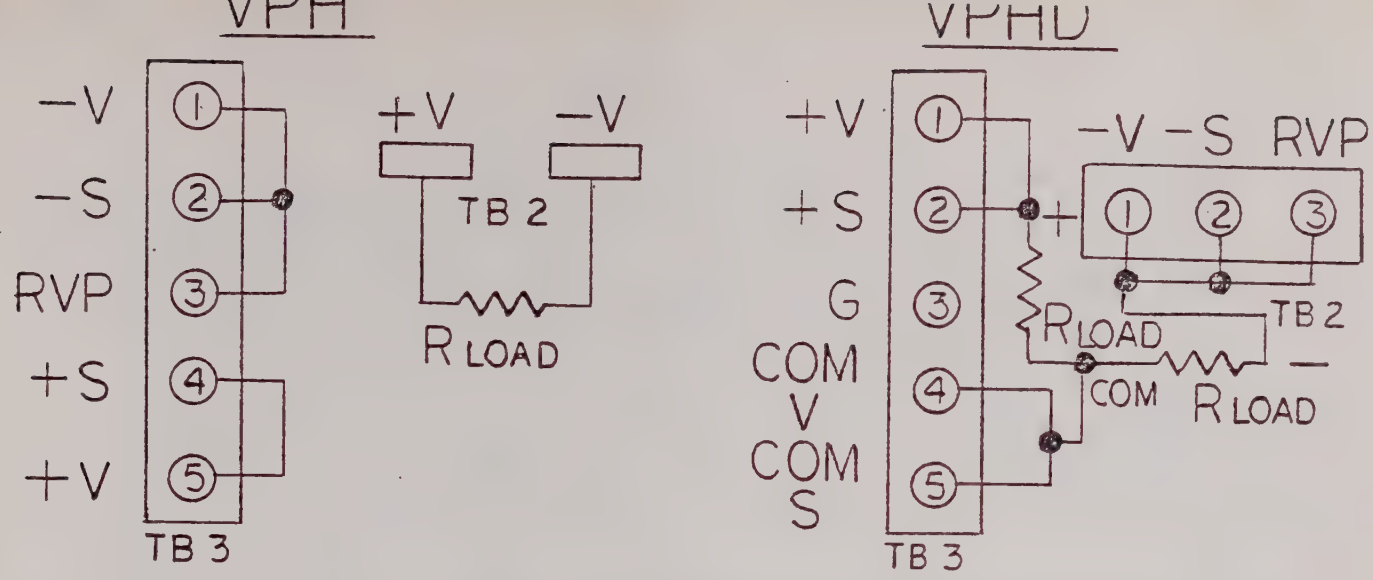


FIG 2-1 LOCAL PROGRAMMING, LOCAL SENSING

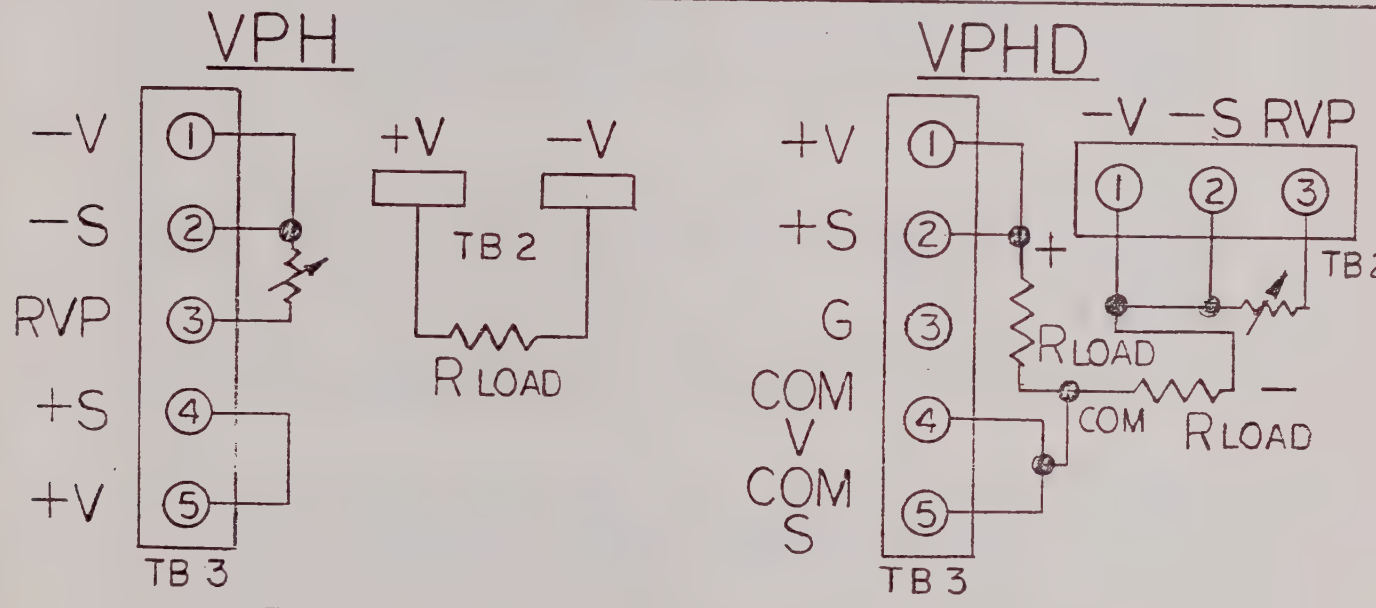


FIG 2-2 REMOTE VOLTAGE PROGRAMMING

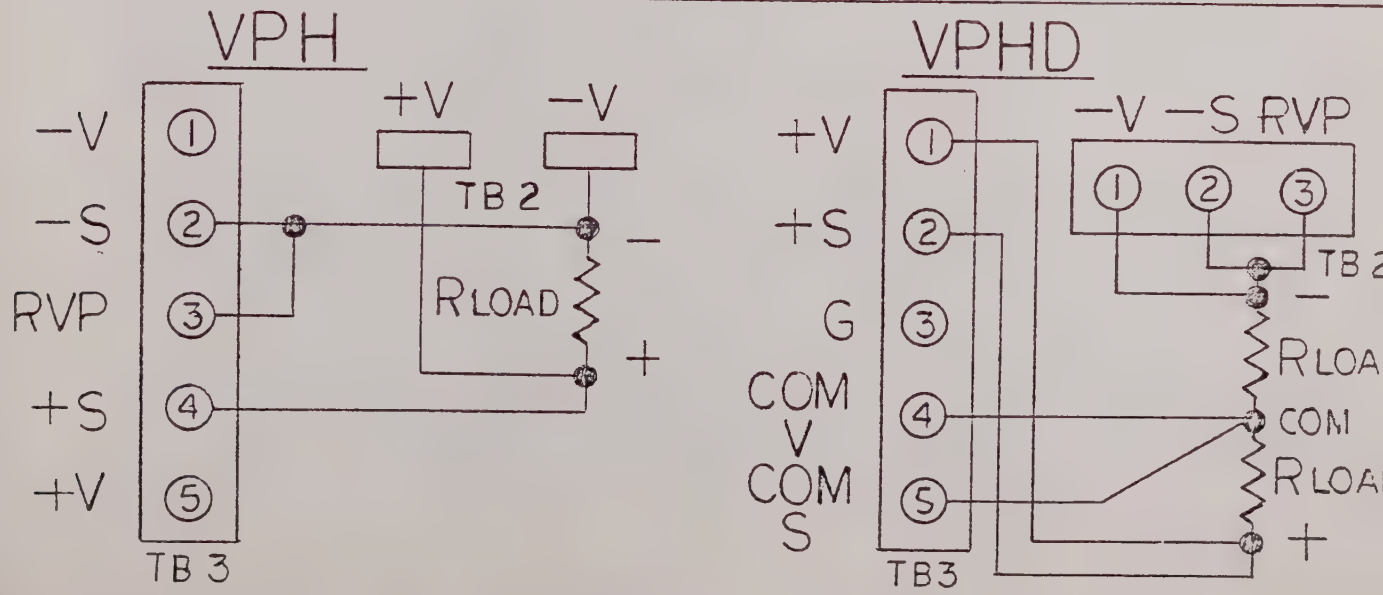


FIG 2-3 REMOTE SENSING

Internal

All internal control settings have been factory preset and require no additional adjusting. However, if it should become necessary to adjust any of the internal controls due to circuit changes caused by component aging or replacement, refer to the calibration section of this manual.

2.5 OPERATION

Control Settings

Set front panel control full CCW, top recessed controls fully CW.

Shorting Links

Prior to the application of power, connect all loads, external wiring and shorting links required for the mode of operation desired.

Grounding

Either side of the output may be grounded, or the output may be used in a floating condition.

Power On

Connect the unit to a nominal AC input power source. Set AC power switch to ON, and observe that pilot lamp is lit.

Warm-Up

No warm-up time is necessary to place the unit into operation. However, a 30 minute warm-up period is recommended to reach rated stability. The unit is now ready for operation.

SECTION 3

THEORY OF OPERATION

3.1 GENERAL

The purpose of the ValuPower series power supplies is to transform and rectify the AC input into a well regulated, stable and adjustable DC output. The following paragraphs describe the major circuits used in the power supply. As each circuit is described, reference should be made to both the Block Diagram, Figure 3-1 and the Schematic Diagram in the rear of this manual.

Primary Input

Input power is obtained through power transformer T101, diodes and filter capacitors. When power switch S101 is set to ON, the output indicator lamp DS 101 glows and AC power is applied to T101 and cooling fan B101. Regulated DC output voltage is immediately available from the power supply.

Series Regulator

The rectified voltage from the diodes and filter capacitors is directed through the Series Pass transistors. The conduction of these transistors is controlled by circuitry which causes them to act as variable resistors. Their overall resistance varies in accordance with the need of the power supply to increase or decrease its output voltage or current. The Series Pass transistors are controlled by driver stages which amplify signals from the Error Amplifier.

Reference Supply, Comparator, Error Amplifier, and Current Limiting

A single integrated circuit, A1, combined the circuitry required to perform the task usually required by many discrete components.

The stable reference voltage is generated and indicated at the circuit reference V REF. When A1 gets the zener regulated voltage across its terminals 5 and P, a precision voltage reference is developed across its terminals 4 and 5. A fixed sample of this voltage is fed into terminal 2 which is one input of the error amplifier.

The voltage which A1 compares the reference voltage to, is fed into terminal 3. Any change in the output voltage is automatically compensated for as the error amplifier generates a correction drive signal at terminal 6 which changes the output voltage accordingly.

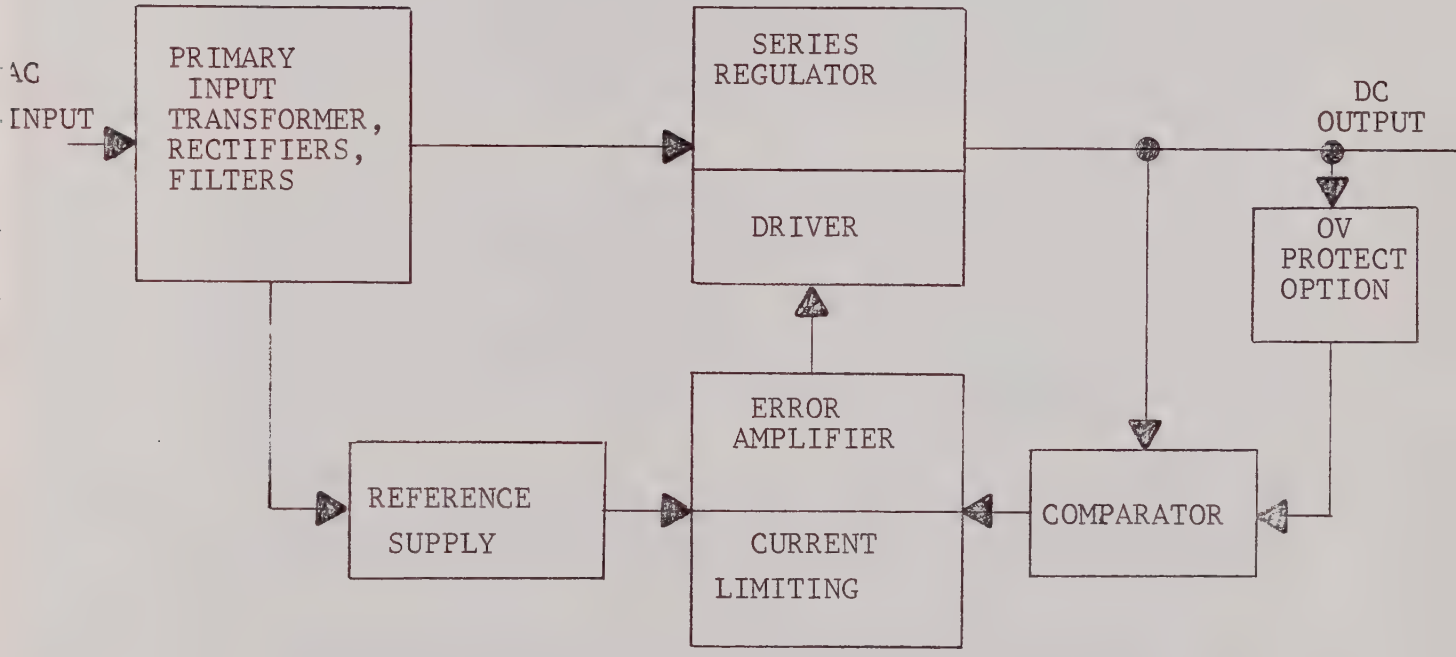
Current limiting is provided by input 10 which will control the error amplifier's output when an overcurrent condition is present.

Terminal A is a compensating input to A1, to insure stability and prevent oscillations under certain load conditions.

3.1 Continued

Overvoltage Circuit (Option)

A sample of the output voltage is developed across R21. This sample is brought to terminal 1 (anode) of the silicon unilateral switch (SUS), which has the characteristics of suddenly conducting when the applied voltage exceeds a minimum threshold. When the SUS conducts it applies a gate signal to the SCR, which crowbars the output to nominal zero.



BLOCK DIAGRAM

FIGURE 3-1

NOTE: The dual output unit uses the negative output as the Master voltage with the positive output circuitry tracking automatically.

SECTION 4

CALIBRATION AND MAINTENANCE

4.1 GENERAL

The following adjustments should be made when necessary to assure optimum operating characteristics and maximum efficiency of the ValuPower series power supplies.

4.2 TEST EQUIPMENT REQUIRED (Or Equivalent)

1. Systron Donner Digital Multimeter Type 9025
2. External Current Shunt (150A rating)
3. Variable Auto transformer, 30 ampere rating

Shorting Link Application

For test purposes shorting links should be connected across rear panel barrier strip terminals 1 and 2, 2 and 3, 4 and 5, and 6 and 7 to provide local sensing and local voltage programming operation. To reduce pickup, shielded wire must be used for all connections between test equipment and the power supply being tested. To prevent ground loops, it is important that only one ground connection be made, as shown in Fig. 4-1. Tighten all terminals as securely as possible and set the front panel control. CW.

4.3 CALIBRATION PROCEDURE

Ammeter Calibration

1. Using a standard ammeter in series with an external load, adjust the load so the unit will operate at its maximum rated current (as indicated on the standard ammeter) and voltage output.
2. Adjust ammeter adjust control (VPH R24, VPHD R45) until ammeter M101 indicates the same current as the standard meter.

Current Limit Test

1. Establish nominal output voltage
2. Set current limit control VPH R11, VPHD R3 fully CW
3. Using an external load, apply a 20% current overload to the unit under test.
4. Adjust current limit control until the overload, as indicated on ammeter MI, is limited to between 5% and 10% (1.05 to 1.10 maximum rated current).

4.3 Continued

Constant Voltage Operation

Load Regulation Test

With the equipment connected as shown in Figure 4-1, connect a suitable load resistance across the output terminal connections. The load resistance selected must be able to dissipate the rated power of the unit (P=IE) and must be of sufficient value to yield the rated output current when the rated voltage is applied. Note the voltage indicated on the Digital Voltmeter. Disconnect the resistive load from the output.

The maximum change in output DC voltage should not exceed by more than .02% or 5mv (whichever is greater) that of the output voltage indicated with the load resistance applied across the output terminals.

Line Regulation Test

Place the resistive load across the output and note the voltage indicated on the DVM. Vary the AC input power 10% above and below the nominal AC input level. The maximum change in output voltage should not exceed by more than ±0.02% or mv (whichever is greater) that of the output voltage measured at either extreme of the AC input.

Ripple Voltage Test

In order to reduce pickup, shielded test leads should be used in making ripple measurements. With the resistive load connected across the output terminals, measure the AC ripple with the AC scale of the DVM. Vary the AC input power 10% above and below the nominal AC input level. The maximum ripple amplitude should not exceed 1mv RMS.

Overvoltage Sensitivity (option) (See Page 4-5 for Dual Unit)

The trigger point of the OV protection circuit is determined by the setting of the OV control R21, located through the top cover. To set the OV circuit to trigger within the output range of the power supply, set R21 CW. Turn on the supply and adjust it for the desired OV firing point. Turn R21 CCW until the output voltage drops as indicated by the voltmeter.

To set the OV circuit to fire at higher output voltage than the output voltage of the supply, a second current limiting type power supply is needed. With the supply under test, set its output voltage to any value. Turn R21 CW and connect the second supply across its output terminals. Set the second supply's output voltage to the desired OV firing point. Turn R21 CCW until the output of the supply drops to a low value as indicated on the voltmeter. This indicates that the OV circuit has fired at the voltage set on the second power supply.

4.4 MAINTENANCE

GENERAL

This power supply is a precision electronic instrument. It is strongly recommended that only experienced troubleshooting personnel perform troubleshooting operations or attempt to repair the unit. If the power supply appears to be malfunctioning at all, the following procedure is recommended for isolating possible defects.

Loads and Interconnections

1. Disconnect all loads and interconnections.

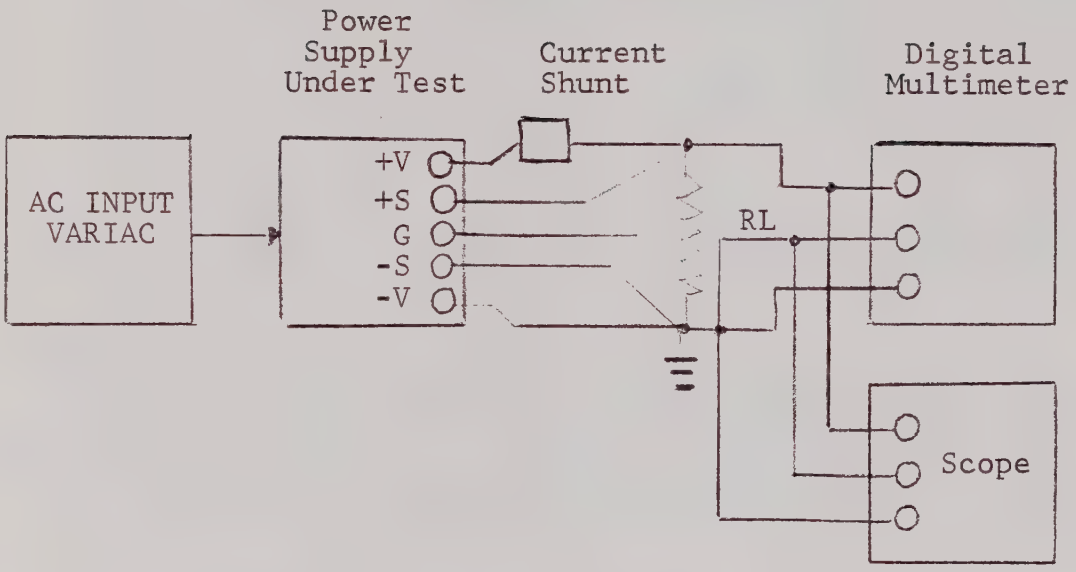
2. Connect a resistive load across the output terminals and operate the unit to determine whether the fault lies within the unit or externally. Observe that shorting links are in place across terminals to provide local sensing operation.

3. Set input voltage to nominal value (115 VAC) and operating controls for rated output. Satisfactory operation at this time would indicate that any malfunction previously encountered, is external in nature. All interconnections and loads normally used in conjunction with this power supply should then be carefully checked for electrical defects.

Troubleshooting

1. Set Voltage Adjust control fully CW. Use a high impedance digital voltmeter to check the voltages across the various circuit components, if shown on the Schematic Diagram located at the rear of this instruction manual. Any sample voltages listed apply only if the unit is operating at its nominal AC input, and has a dummy load of sufficient size connected across its output to allow operation at maximum rated current and voltage output levels. Any reading which is grossly incorrect, indicates that the stage being tested or the one immediately preceding it is defective. The Block Diagram, Schematic Diagram and appropriate sections of the Theory of Operation will prove helpful in any troubleshooting work. Proper polarity to be observed when testing can be easily obtained from the Schematic Diagram.

2. If voltage checks show no noticeable deviations from the prescribed values, disconnect AC power and proceed with point-to-point resistance checks across pots, switches, diodes, resistors, transistors, in that order.



CONSTANT VOLTAGE
OPERATION

TEST EQUIPMENT SET-UP

FIGURE 4-1

ADDENDUM FOR DUAL OUTPUT VPHD

VPHD OVERVOLTAGE PROTECTION

The overvoltage protection provided on the dual output VPHD is one whereby the total voltage of the plus and minus outputs is sensed. The overvoltage trip point is therefore approximately twice that of each individual supply. If either supply should go high in voltage it will cause the overvoltage crowbar to clamp both the plus and minus outputs to nominal zero volts.

The trigger point of the OV protection circuit is determined by the setting of the OV control R21, located through the top cover.

To set the OV circuit to trigger within the output voltage sum of the plus and minus voltages, set R21 CW. Turn on the supply and adjust the negative output voltage (the negative output is the master voltage with the positive output circuitry tracking automatically) for the desired OV firing point. Turn R21 CCW until the output voltage drops as indicated by the voltmeter.

To set the OV circuit to fire at a higher output voltage than the output voltages of the supply will adjust to, a second current limiting type power supply is needed.

Set the supply under test to its desired voltage with R21 turned CW. Connect the second supply across the plus and minus terminals of the supply under test and set its output voltage to the desired OV trip point. Turn R21 slowly CCW until the OV triggers as indicated by the drop in output voltage. This indicates that the OV circuit has fired at the voltage set on the second power supply.

1	T062100	SHIPPING ASS'Y			XX	
3		SCHEMATIC	D118790		R	R
5B	PD25013	ASS'Y TOP COVER & LABEL			1	2
6C	065613	COVER, FINISHED			1	2
7		NAMEPLATE	T101040		1	R
8	840405	PLUG BUTTON			2	R
9	065148	AC COVER			1	2
12B	PD24996	CHASSIS ASS'Y #1			1	2
13C	065608	CHASSIS			1	2
14	840192	RUBBER FEET			4	1
15	820371	CAP. 25,000μf-25V	C105, 106		3	1
16		S/A C105	C108			R
17	820274	6000μf-40V	C107		1	1
20	106664	FAN	B101		1	1
21	106879	CAP. CLAMP.			1	1
22	100725	" "			1	1
23	065612	" "			1	2
24	T910110	GROMMET			1	R
25C	065609	BRKT, MTG-XFMR & CHOKE			1	2
26						
27						
28	T971020	1/4-20x1 1/4 HEX BOLT			2	1
29C	119112	FAN PLATE RIGHT			1	2
30C	119122	" " LEFT			1	2
31	T910010	GROMMET, 3/16			1	R
32	065614	BAFFLE			1	2
33		INSULATION-TAPE			1	R

SHIPPING ASS'Y
VPH 5-60

ITEM NO.	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT CODE	ISS. QTY	SHT QTY
38B	PD25010	CHASSIS ASS'Y #2		1	2		
39	800304	CAP. 1mf-250V	C103	1	1		
40		S/A	C104		R		
41	504124	TRANSFORMER	T101	1	2		
42	710454	DIODE IN5401	CR101, 102	2	1		
43	504125	CHOKE	L101	1	2		
44							
45B	118222	BUSS BAR POS. OUTPUT		1	2		
46C	118232	" " NEG. OUTPUT		1	2		
47B	122852	STRIP, OUTPUT HOLDING		1	2		
48B	118292	SHUNT	R117	1	2		
49	800185	CAP. .1mf-250V	C101, 102	2	1		
50							
51	100827	6-32 x 5/16 HEX SPACER		2	1		
52	T990450	P.C. SUPPORT		2	1		
56A	PD24995	REAR PANEL ASS'Y		1	2		
57	065611	" " FAB		1	2		
58	117377	FUSEHOLDER		1	1		
59	870212	FUSE 15A-250V	F1	1	1		
60	850150	BARRIER STRIP	TB1	1	1		
61B	118242	INSULATOR BLOCK	TB2	1	2		
62	850052	BARRIER STRIP	TB3	1	1		
63	840217	" " LINKS		3	1		
64	100827	HEX SPACERS 5/16 Lg		2	1		
65	116901	PLUG BUTTON		1	R		

REVISIONS
LTR | DESCRIPTION

MODEL | JOB NO. | LOT QTY | LOT NO. | CODE IDENT NO. 52542

PLANNER | DASP | DATE | SYSTRON DONNER CORPORATION

CHK'D | MAT. DUE | APP'D | B/U REQ. | B/U COMP | USED ON

SHIPPING ASS'Y VPH5-60

DRAWING NO. | SIZE | PART NO.
P T062100

SHEET 2 OF 7

FORM SB-A 11 JUL 72

ITEM NO.	REV	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT CODE	ISS. QTY	SHT QTY
70A		PD25009	FRONT PANEL ASS'Y		1	2		
71C		118284	" " FINISH		1	2		
72A		06516701	METER ASS'Y 0-100A	M101	1	2		
73		065160	METER MVMT 1mA 77Ω		1	1		
74		117397	DIAL, BLANK	B065167	1	1		
75B		06516902	METER ASS'Y 0-8V	M102	1	2		
76B		065160	METER MVMT 1mA 77Ω		1	1		
77		117397	DIAL, BLANK	B065169	1	1		
78		065049	P.C. BOARD		1	2		
79		102181	POT. 1T-WW 1K	R401	1	1		
80		102278	RES. 7.5K	R402	1	1		
81		103862	HEX NUT		1	1		
82		116669	SWITCH	S101	1	1		
83		770090	LED	DS101	1	1		
84		600140	POT. V. ADJ 500-2W	R116	1	1		
85		840220	SHAFT-LOCK		1	1		
86		085810	OUTPUT LABEL	PD25013	1	1		
89A		PD25173	HEAT-SINK ASS'Y #2		1	2		
90C		118982	HEAT-SINK		1	2		
91		705071	TRANSISTOR, 2N3447	Q101 Q102	2	1		
92		700196	2N4912	Q103	1	1		
93		830101	TRANSISTOR SOCKET		2	1		
94		830103	" "		1	1		
95		640020	RES. .2Ω-3W 10%	R101 R102	2	1		
96		101467	1K-½W	R103	1	1		
97		101498	100Ω-½W	R114	1	1		
98		859019	TERMINAL STRIP		1	1		
99		103358	MICA WASHER		2	R		

REVISIONS DESCRIPTION REV

MODEL | JOB NO. | LOT QTY | LOT NO. | CODE IDENT NO. 52542

PLANNER | PREP DATE | CHK'D | APP'D | MAT. DUE | B/U REQ. | B U COMP | USED ON

SYSTRON DONNER CORPORATION

SHIPPING ASS'Y
VPH 5-60

DRAWING NO.
REF SIZE | PART NO. | REV
— | P T062100

SHEET 3 OF 7

FORM 58-A 11 JUL 75

ITEM NO.	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASS'Y QTY	ACT. ISS. CODE	ACT. ISS. QTY	SHT QTY
		HEAT-SINK ASS'Y #2 (CONT)		XX			
01	100551	MICA WASHER		1	R		
058	PD25007	HEAT-SINK O.V. ASS'Y		1	2		
06D	T115802	HEAT-SINK FAB		1	2		
07B	065444	BRKT PC SUPPORT		2	2		
08	640190	RES. 10Ω-2W	R115	1	1		
09	640011	.1Ω-5W	R104-R113	10	1		
10							
11							
12	118602	BUSS BAR EMITTER		1	2		
13							
14	860270	6-32x¼ HEX SPACER		2	1		
15	T990415	NYLON PUSH-IN NUT		3	R		
16	T990405	" " " "		2	R		
17	T990450	BRKT, P.C. SUPPORT		2	1		
18	118992	HEAT-SINK (ADDITION)		1	2		
19	T960347	RIVET		4	R		
20	700401	TRANSISTOR, 2N3771	Q104-Q113	10	1		
21							
22	720129	DIODE	CR107	1	1		
23	720132	DIODE, IN1200A	CR108	1	1		
24	720330	" 70H10A	CR103, 104	2	1		
25	830101	TRANSISTOR SOCKET		10	1		
26	T990350	RING INSULATOR		1	R		
27	T990307	MICA WASHER		2	R		
28	T960085	SOLDER LUG		1	R		
29	880003	THERMAL SWITCH	S102	1	1		
30	720008	DIODE, SCR, 35A-50V	CR106	1	1		
31	T990340	RING INSULATOR		3	R		
32	100551	MICA WASHER		2	R		

REVISIONS
QTY | DESCRIPTION

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT NO.
				52542

PLANNER | PREP DATE | SYSTRON DONNER CORPORATION

CHK'D

MAT. DUE | APP'D

SHIPPING ASS'Y
VPH 5-60

B/U REQ.

DRAWING NO.

SIZE	PART NO.	REV
B	T062100	P

B/U COMP | USED ON | SHEET 4 OF 7

FORM 88-A 11 JUL 75

ITEM NO.	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT QTY	N.S. QTY	SHT QTY
		HEAT-SINK QV. ASS'Y (CONT.)		XX			
134	T960640	LUG		1	R		
138C	PD25006	CONTROL BOARD ASS'Y		1	2		
139D	T112256	" " FAB		1	2		
140	102598	CAP. 100μf-50V	C1	1	1		
141	800090	.01μf-600V	C3,8	2	1		
142	800002	470pf-600V	C4	1	1		
143	810060	35μf-25V	C5,6	2	1		
144	100134	.05μf-200V	C7	1	1		
145	100178	.1μf-100V	C9	1	1		
146				1	1		
147	821006	68μf-15V	C11	1	1		
148	100063	10μf-25V	C12	1	1		
149	102582	200μf-25V	C13	1	1		
153	100413	DIODE, IN5395	CR1,2,6,7,	6	1		
154			12,13		R		
155	720410	IN4741A	CR3	1	1		
156	100387	IN753A	CR4	1	1		
157	720167	IN5221B	CR5	1	1		
158	100415	IN746A	CR8	1	1		
159	741001	SCR, 2N4990	CR9	1	1		
160							
161	720440	IN4148	CR11	1	1		
165	025756	IC	A1	1	1		

REVISIONS DESCRIPTION

NEW

MODEL	JOB NO.	LOT QTY	LOT NO.
PLANNER	PREP DATE	SYSTRON DONNER CORPORATION	
	CHK'D	SHIPPING ASS'Y VPH5-60	
MAT. DUE	APV'D		
B/U REQ.		DRAWING NO.	
B/U COMP	USED ON	SIZE P T062100	
		SHEET 5 OF 7	

FORM 30-A 11 JUL 73

ITEM NO.	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	SERVICE QTY	DOC QTY	SHIP QTY
		CONTROL BD ASS'Y (CONT)		XX			
167	106587	TRANSISTOR, 2N2219A	Q1	1	1		
169	640390	RES. 220Ω 2W 10%	R1	1	1		
170	600207	POT. 2K-½W-20%	R3	1	1		
171	620436	2.26K-½W-1%	R4	1	1		
172	620488	3.4K	R5	1	1		
173	620534	4.64K	R6	1	1		
174	620402	1.96K	R7	1	1		
175	106012	2.2Ω	R8, 14	2	1		
176	117188	POT. 100Ω-½W	R11, 16, 21, 4	1			
177			R24			R	
178	101474	330Ω½W 5%	R12 R13	2	1		
179							
180	640434	400Ω 5W 5%	R15	1	1		
181	640182	7.5Ω 10W	R17 R18	2	1		
182							
183	640250	20Ω 5W 5%	R19	1	1		
184	640140	3.3Ω 2W 10%	R20	1	1		
185	101459	1.5K-½W-5%	R22	1	1		
186	101467	1K-½W-5%	R23, 29	2	1		
187	640380	150Ω 2W 10%	R25	1	1		
188	611100	2.2M-½W-5%	R26	1	1		
189	101511	4.7K-½W-5%	R27, 31	2	1		
190	101510	6.8K-½W-5%	R28	1	1		
191	101667	220Ω-½W-5%	R30	1	1		
192	101454	2.2K-½W-5%	R32	1	1		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT. 52642	
PLANNER	PREP DATE	SYSTRON DONNER CORPORATION			
	CHK'D	SHIPPING ASS'Y VPH5-60			
MAT. DUE	APP'D				
B/U REQ.		DRAWING NO.			
		REF SIZE	PART NO.	REV.	
B.U COMP		— P T062100			
	USED ON	SHEET 6 OF 7			

REVISIONS DESCRIPTION

KEY

ITEM NO.	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	DOCUMENT QTY
199	T942306	AC-DC HARNESS		1	2
200	PD24991	HARNESS LIST			R
201	VPH-1	" LAYOUT			R
203	T942416	DC CABLE		1	2
204	PD27091	" " LIST			R
205	VPH-2	" " LAYOUT			R
207	PD25005	LOOSE WIRES		1	2
211A		WIRING, T101 & L101	PD25001	1	R
212A		" REAR PANEL	PD24998	1	R
213A		" FRONT PANEL	PD25012	1	R
214A		" P.C. BOARD	PD25003	1	R
215A		" HEAT-SINK	PD25174	1	R
216B		" " "	PD25008	1	R
217B		" CHASSIS	PD25011	1	R

REVISIONS DESCRIPTION REV

MODEL | JOB NO. | LOT QTY | LOT NO. | CODE IDENT NO. 52542

PLANNER | PREP DATE | CHK'D | MAT. DUE | APP'D | B/U REQ. | S/U COMP

SYSTRON DONNER CORPORATION

SHIPPING ASSY VPH 5-60

DRAWING NO. SIZE P PART NO. T062100 REV —

USED ON | SHEET 7 OF 7

FORM E8-A 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY
1		T062600	SHIPPING ASSY		X	X	
2	E		SCHEMATIC	T120060	1	R	
3	B	PD25368	TOP COVER & LABEL MTG.		1	2	
4		065645	TOP COVER FAB		1	2	
5		065148	AC-COVER		1	2	
6		860181	ROUND SPACERS		2	1	
7		085860	LABEL		1	1	
9		PD25359	CHASSIS ASSY #1		1	2	
10		065638	CHASSIS		1	2	
11		840192	RUBBER FEET		1	1	
12		820371	CAPACITORS 25,000uf-25V	C102, 103	4	1	
13			S/A C102	C105, 106			
14		820276	5,500uf-35V	C107, 108	2	1	
15		10666A	FAN	B101	1	1	
16		100725	BRACKET CAPACITOR		2	1	
17		T900068	" " 2"		2	1	
18		065612	" "		1	2	
19		065614	BAFFLE		1	2	
20		119112	PLATE FAN BAFFLE	(RH)	1	2	
21		119122	" " "	(LH)	1	2	
22		065639	MTG. BKT. XFMR & CHOKE		1	2	
23			" " " ASSY	PD25358	1	R	
27		PD25357	REAR PANEL ASSY		1	2	
28		065635	REAR PANEL		1	2	
29		117377	FUSEHOLDER		1	1	
30		870212	FUSE 15A 250V	F1	1	1	
31		850150	BARRIER STRIP	TB1	1	1	
32		800252	CAPACITOR .22uf-250V	C109	1	1	
33							

REVISIONS
DESCRIPTION
REV
A — CHANGE PER ECO 15157 5-20-75 - R/B

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE ID
				5254

PLANNER | PREP DATE | SYSTRON DONNER CORPORATION
CHK'D
MAT. DUE | APP'D
B/U REQ.
B/U COMP
USED ON

SHIPPING ASSY
VPHD 15-13-04

DRAWING NO.

REF	SIZE	PART NO.
—	P	T062600

SHEET 1 OF 8

FORM E8-A 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
34		PD25357	REAR PANEL ASS'y (CONT.)		XX	XX		
36		850058	BARRIER STRIP	TB2	1	1		
37		850052	" "	TB3	1	1		
38		840217	" " LINKS		A	1		
39		100486	SOLDER LUG #6		1	R		
40A			REAR PANEL WIRING	PD25363	1	R		
42		PD25360	CHASSIS ASS'y #2		1	R		
43		504144	TRANSFORMER		1	2		
44		0656A2	BUS BAR		3	2		
45		0656A3	" "		1	2		
49A		PD25356	FRONT PANEL ASS'y		1	2		
50		11953A	FRONT PANEL		1	2		
51		06517002	METER ASS'y 0-20V	M101	1	R		
52		06516401	" " 0-15A	M102	1	R		
53		880611	SWITCH	S101	1	1		
54		770090	LED	DS101	1	1		
55		600230	POT V. ADJ 2.5K 2W	R111	1	1		
56		880616	SWITCH V/I	S102	1	1		
59		PD2535A	HEATSINK ASS'y #1		1	2		
60		0656A1	HEATSINK		1	2		
61		0654A6A	BRACKET, PC SUPPORT		3	2		
63		T960347	POP RIVET		6	R		
64		T990415	NYLON - PUSH IN NUT		3	R		
65		PD25355	HEAT-SINK ASS'y #2		1	R		
66		T990450	P.C. SUPPORT		5	1		

REV | DESCRIPTION

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT 52542
PLANNER	PREP DATE	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'y VPHD15-13-0V		
MAT. DUE	APP'D			
B/U REQ.		DRAWING NO. REF — SIZE P PART NO. T062600 REV		
B/U COMP	USED ON	SHEET 2 OF 8		

FORM EB-A 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SH QT
67			HEAT-SINK ASS'Y #1 (CONT)					
			#6 STAND-OFF		6	1		
70		700401	TRANSISTOR 2N3771	Q101-Q110	10	1		
71		830101	TRANSISTOR SOCKETS		10	1		
72		T990290	MICA-WASHER		5	R		
73		720132	DIODE IN1200A-1	CR104+105	2	1		
74		T990350	RING, INSULATOR		2	R		
75		T990307	MICA-WASHER		4	R		
76		T960085	SOLDER, LUG		2	R		
77		720010	DIODE - SCR C35F	CR109	1	1		
78		T990340	RING, INSULATOR		3	R		
79		T990295	MICA-WASHER		2	R		
80		T960640	LUG		1	1		
81		720129	DIODE - IN1199A-1	CR107+108	2	1		
82		880003	SWITCH THERMAL	S103	1	1		
83		860020	#4 STAND OFF		1	1		
84		640020	RESISTOR .2 ± 3W	R101-R110	10	1		
85		710454	DIODE IN5401	CR103, 106	2	1		
86		800285	CAPACITOR .47μf-250V	C104	1	1		
90		PD254629	DIODE BKT ASS'Y		1	2		
91		120582	DIODE BKT		1	2		
92		720132	DIODE IN1200A-1	CR101-102	2	1		
93		800285	CAPACITOR .47μf-250V	C101	1	1		
94		T960085	LUG		2	R		
95		T990307	MICA-WASHER		4	R		
96		T990350	INSUL. RING NYLON		2	R		
97		T990306	FLAT-WASHER		2	R		
98		T990170	LOCK-WASHER		2	R		
99		T980101	HEX-NUT		2	R		

REVISIONS

REV	DESCRIPTION

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDEN
				52542

PLANNER | PREP DATE | CHK'D | APP'D | MAT. DUE | B/U REQ. | B/U COMP | USED ON

SYSTRON DONNER CORPORATION

SHIPPING ASS'Y
VPHD 15-13 OV

DRAWING NO.

REF	SIZE	PART NO.	REV
—	P	T062600	

SHEET 3 OF 8

FORM EB-A 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
00			CHASSIS WIRING	FD25365	1	R		
01			" REAR "	FD25363	1	R		
04		T942344	AC/DC HARNESS		1	2		
05		FD25352	AC/DC " LIST		1	R		
07			HARNESS LAYOUT	VPHD-1	1	R		
08		T942426	DC HARNESS		1	2		
09		FD27202	DC " LIST		1	R		
10			HARNESS LAYOUT	VPHD-2	1	R		
12		FD25366	JUMPER LIST		1	2		
18		FD25351	COMPONENT BD-ASS'Y		1	2		
01		119986	COMPONENT-BOARD		1	2		
02		T960665	EYELET		4	1		
03		T960466	TERMINAL		10	1		
04		543131	— " —		24	1		
06		741002	I.C. - μA723C	A1 A2	2	1		
08		810132	CAPACITOR 100μf 50V	C1	1	1		
09		800090	.01μf-600V	C2	1	1		
10		800168	.05μf-200V	C5	1	1		
11		800176	.1μf-100V	C6	2	1		
12		810060	35μf, 25V	C7	5	1		
13			S/A C6	C8				

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT 52542
PLANNER	PREP DATE	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'Y VPHD15-13-0V		
MAT. DUE	APP'D			
B/U REQ.		DRAWING NO. REF — SIZE P PART NO. T062600 REV		
B/U COMP		USED ON	SHEET 4 OF 8	

REV DESCRIPTION

FORM E8-A 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SH QT
116			COMPONENT BD-ASS'Y (CONT.)					
118		800055	CAPACITOR .0068μf, 600V	C10	1	1		
119			S/A C7	C11				
120				C12				
121				C13				
122				C14				
123		821023	15μf 20V	C15	2	1		
124			S/A C15	C16				
125		80025A	.22μf 400V	C17	1	1		
126		106489	.022μf 250V	C18	1	1		
129		100413	DIODE IN5395	CR1	6	1		
130			S/A CR1	CR2				
131		720419	IN4747A	CR3	1	1		
132		720440	IN4148	CR4	5	1		
133		100378	IN751A	CR5	4	1		
134			S/A CR4	CR6				
135			" "	CR7				
136		100425	IN4739A	CR8	1	1		
137			S/A CR5	CR9				
138		741001	2N4990	CR10	1	1		
139			S/A CR1	CR11				
140		100383	IN965B	CR12	1	1		
141			S/A CR4	CR13				
142			CR5					
143			CR4					
144			CR5					
145			CR1					
146			CR1					
147			CR1					

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDE
				52542

PLANNER | PREP DATE | SYSTRON DONNER CORPORATION

CHK'D | SHIPPING ASS'Y YPHD15-13-0V

MAT. DUE | APP'D

B/U REQ.

DRAWING NO.

REF	SIZE	PART NO.
—	P	T062600

B/U COMP

USED ON

SHEET 5 OF 8

ITEM NO	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
149		COMPONENT BD - ASS'Y (CONT.)					
151	705071	TRANSISTOR 2N3447	Q1	2	1		
152	705067	2N2905A	Q2	2	1		
153		S/A Q1	Q3				
154		S/A Q2	Q4				
155	103856	HEAT SINK		2	1		
156	640500	RESISTOR 1K 2W 10%	R1	1	1		
157	600046	POT 100Ω 1/2W 20%	R2	7	1		
158		S/A R2	R3				
159	620360	1.5K 1/2W 1%	R4	2	1		
160	620300	1K 1/2W 1%	R5	2	1		
161	101539	470Ω 1/2W 5%	R7	5	1		
162	101667	220Ω 1/2W 5%	R8	2	1		
163	101498	100Ω 1/2W 5%	R9	3	1		
164	101467	1KΩ 1/2W 5%	R10	3	1		
165	101471	10KΩ 1/2W 5%	R11	1	1		
166		S/A R10	R12				
167		S/A R2	R13				
168		S/A R15	R14				
169	620402	1.96K 1/2W 1%	R15	2	1		
170	640400	250Ω 10W	R16	2	1		
171		S/A R16	R17				
172	640510	1K 5W 5%	R18	1	1		
173	101527	150Ω 1/2W 5%	R19	1	1		
174	101459	1.5K 1/2W 5%	R20	1	1		
175	600133	POT 500Ω 1/2W 20%	R21	1	1		
176		S/A R10	R22				
177		R7	R23				
178		R7	R24				
179		R7	R25				
180		R2	R26				

MODEL	JOB NO	LOT QTY	LOT NO.	CODE IDENT 52542
PLANNER	PREP DATE	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'Y		
MAT. DUE	APP'D	YPHD 15-13-0V		
B/U REQ.		DRAWING NO.		
		REF —	SIZE P	PART NO. T062600
B/U COMP	USED ON	SHEET 6 OF 8		

REV

ES-4 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY
182			COMPONENT BD. ASS'Y (CONT.)				
184			RESISTOR S/A R2	R27			
185			" R4	R28			
186			" R5	R29			
187		101454	2.2K 1/2W 5%	R30	2	1	
188		640528	1.8K-2W	R31	1	1	
189		101504	680K-1/2W 5%	R32	2	1	
190		600207	POT 2K-1/2W 20%	R33	1	1	
191		620436	2.26K-1/2W 1%	R34	1	1	
192		620593	6.65K-1/2W 1%	R35	1	1	
193			S/A R9	R36			
194			R8	R37			
195			R30	R38			
196			R9	R39			
197			R7	R40			
198		620519	4.42K 1/2W 1%	R41	1	1	
199		620434	2.1K 1/2W 1%	R42	1	1	
200		068761	SHUNT 15A	R43	2	2	
201			S/A R2	R44			
202			R2	R45			
203			R43	R46			
204			R32	R47			
209			WIRING T101	PD25361	R	-	
210			P.C. BOARD	PD25367	R	-	
211			FRONT PANEL	PD25362	R	-	
212			DIODE	PD25469	R	-	
213			HEATSINK OV	PD2536A	R	-	

REVISIONS
BY | DESCRIPTION

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE ID 52542
PLANNER	PREP DATE		SYSTRON DONNER CORPORATION	
	CHK'D		SHIPPING ASS'L VPHD15-13-0V	
MAT. DUE	APP'D			
B/U REQ.			DRAWING NO.	
B/U COMP			REF — SIZE P PART NO. T062600	RE
	USED ON		SHEET 7 OF 8	

FORM E8-A 11 JUL 75

ITEM NO	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
		FRONT PANEL ASS'Y (CONT.)					
216A	065164-01	METER ASS'Y 15A	M102	1	2		
217D	065160	METER MVMT 1ma 77Ω		1	1		
218	117397	DIAL, BLANK	B 065164	1	1		
220B	065170-02	METER ASS'Y 20V	M101	1	2		
221D	065160	METER MVMT 1ma 77Ω		1	1		
222	117397	DIAL, BLANK	B 065170	1	1		
223	065049	P.C. BOARD		1	1		
224	117123	POT IT-WW 2K	R401	1	1		
225	117126	RES. MF 19.1K	R402	1	1		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT 52542
PLANNER	PREP DATE	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'Y VPHD15-13-0V		
MAT. DUE	APP'D			
B/U REQ.		DRAWING NO.		
		REF —	SIZE P	PART NO.
B/U COMP		USED ON	SHEET 8	OF 8

REVISIONS DESCRIPTION REV

FORM E8-A 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SH QT
1		T062200	SHIPPING ASS'Y., VPH 12-35 OV		-	2		
5	E		SCHEMATIC, OV	T011879	REF	-		
9	B	P002562B	ASS'Y., TOP COVER & LABEL		1	2		
10	C	065613	COVER, FINISHED		1	1		
11	E	065143	AC - COVER		1	2		
12		860181	ROUND SPACERS		2	1		
13			NAMEPLATE		1	R		
15		840405	PLUG BUTTON		1	R		
17	B	P002508	ASS'Y., CHASSIS #1		1	2		
18	C	065608	CHASSIS, FINISHED		1	2		
19	B							
21		840192	FEET, RUBBER		4	1		
22		T970220	1/4-20 x 1 1/4 HEX BOLT		2	1		
23		820334	CAPACITOR, 12,000uF, 40V	C105,106,108	3	1		
25		820274	,6000uF, 40V	C107	1	1		
27		106664	FAN	B101	1	1		
29		106879	CLAMP, CAPACITOR		1	1		
31		100725			1	1		
33	C	065612			1	2		

REVISIONS

REV	DESCRIPTION
A	CHANGE PER ECO 15147 1-23-80
B	CHANGE PER ECO 15153 5-20-80

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDEN 52542
PLANNER	PREP DATE 10-22-75	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'Y		
MAT. DUE	APP'D	VPH 12-35 OV		
B/U REQ.		DRAWING NO.		
B/U COMP	USED ON	REF — SIZE P PART NO. T062200 REV		
		SHEET 1 OF 2		

FORM 68-A 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
		PD025606	ASS'Y., CHASSIS #1		—	—		
33								
34		065609	BRKT, MTG., XFMR & CHOKE		1	2		
35		T9101110	GROMMET		1	R		
36		PD025616	ASSLY, HEAT SINK #2		1	2		
37		640020	RES. .2Ω 3W	R101	1	1		
38		101467	1K 1/2W	R103	1	1		
39		101498	100Ω 1/2W	R114	1	1		
41	A							
42		111982	HEATSINK, ADDITION #1		1	2		
43		705071	TRANSISTOR	Q101	1	1		
44		700196	↓	Q103	1	1		
45		830101	SOCKET, TRANSISTOR		1	1		
46		830103	↓ ↓		1	1		
47		T990290	WASHER, MICA		1	R		
48		T990285	↓ ↓		1	R		
49		359019	STRIP, TERMINAL		1	1		
51		065614	BAFFLE		1	2		
51	C	119112	PLATE, FAN, RIGHT		1	2		
52	C	119122	↓ , ↓ , LEFT		1	2		
53		T950174	INSULATION, RUBBER		1	R		
54		T9100010	GROMMET, 3/16		1	R		
55	A	PD025607	ASS'Y., PANEL REAR		1	2		
56		065611	REAR PANEL		1	2		
57		117377	HOLDER, FUSE		1	1		
58		870212	FUSE, 15A, 250V	F1	1	1		
59		850150	STRIP, BARRIER	TB1	1	1		
60		118242	BLOCK, INSULATOR	TB2	1	2		
61		850052	STRIP, BARRIER	TB3	1	1		
62		840217	LINK, BARRIER STRIP		1	1		
63		PD025625	ASS'LY, CHASSIS №2		1	2		
64	B	300304	CAP. 1μF 250V	C103 & 104	2	2		
65		504178	TRANSFORMER	T101	1	2		

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER	PREP DATE	SYSTRON DONNER CORPORATION
	CHK'D	SHIPPING ASS'Y
MAT. DUE	APP'D	VPH 12-35 OV
B/U REQ.		DRAWING NO.
B/U COMP	USED ON	REF — SIZE P PART NO. T062200 REV
		SHEET 2 OF 5

REVISIONS
REV DESCRIPTION

PAGE 3

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SH QT
		PD025622E (CONT)	ASS'Y., CHASSIS #2		—	—		
66		716454	DIODE IN5401	CR101 + 102	2	1		
67		504177	CHOKE	L101	1	2		
68	B	118222	BAR, BUSS, POS. OUTPUT		1	2		
69	C	118232	BAR, BUSS, NEG. OUTPUT		1	2		
70	B	118292	SHUNT		1	2		
71		800185	CAP. .1μF 250V	C101 + 102	2	1		
72	A	PD025624	ASS'Y., FRONT PANEL		1	2		
73	C	118284	FRONT PANEL, FINISH		1	2		
74								
75		065164001	METER, 0-50 A	M101	1	R		
76		065170002	METER, 0-20 V	M102	1	R		
77		880611	SWITCH	S101	1	1		
78		770090	L.E.D.	DS101	1	1		
79		600188	RESISTOR, VADJ, 1.5K 2W	R116	1	1		
80		840220	SHAFTLOCK		1	1		
81	B	PD025622	ASS'Y., HEATSINK, OV		1	2		
82	D	T115802	HEATSINK, FAB.		1	2		
84	A		ASS'Y., HEATSINK #3	PD025620	1	2		
86	B	065444	BRKT., P.C. SUPPORT		2	2		
87		T990459	P.C. SUPPORT		4	1		
88	C	118992	#'SINK ADDITION		1	2		
90	C	118602	BAR, BUSS, EMITTER		1	2		
92					2	1		
93								
94		T990415	NUT, PUSH, NYLON		3	R		
97		T990406	NUT, PUSH, NYLON		2	R		

REVISIONS DESCRIPTION

REV

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDEN 52542
PLANNER	PREP DATE KAT 10-23-75	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASSY		
MAT. DUE	APP'D	VPH 12-35 OV		
B/U REQ.		DRAWING NO. REF — SIZE P PART NO. T062200		
B/U COMP	USED ON	SHEET 3 OF 8		

FORM E8-A 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
		P D 0 2 5 6 2 2 (CNS)	ASS'Y., HEATSINK, OV		—	—		
99		T960347	RIVET		4	R		
100		640190	RES. 10Ω 2W	R115	1	1		
101		705071	TRANSISTOR,	Q104-113	10	1		
102		640011	RES. .12Ω 5W	R104-113	10	1		
103		720132	DIODE	CR108	1	1		
105		720129		CR107	1	1		
107		720335	↓ IN1184A	CR103 & 104	2	1		
109		830101	SOCKET, TRANSISTOR		10	1		
111		T990350	RING, INSULATOR		1	R		
113		T990307	WASHER, MICA		2	R		
115		T960085	LUG, SOLDER		1	R		
117		880003	SWITCH, THERMAL	S102	1	1		
119								
121		720033	DIODE - SCR	CR106	1	1		
123		T990340	RING, INSULATOR		3	R		
125		T990295	WASHER, MICA		2	R		
127		T960640	LUG		1	R		
129								

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT
				52542

PLANNER	PREP DATE	SYSTRON DONNER CORPORATION
	10-23-75	
	CHK'D	SHIPPING ASS'Y
MAT. DUE	APP'D	VPH 12-35 OV
B/U REQ.		DRAWING NO.
		REF — SIZE P PART NO. T062200 REV
B/U COMP	USED ON	SHEET 4 OF 8

REVISIONS
REV | DESCRIPTION

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
		PD025635 (CONT)	ASSY., CHASSIS #2		—	—		
131	B	122852	STRIP, OUTPUT HOLDING		1	2		
133	C	PD025621	ASSY., COMP. BD.		1	2		
135	D	T112256	FAB., P.C.B		1	2		
137		T960464	TERMINAL		16	R		
138		543131	" RIGHT ANGLE		16	R		
141		102593	CAPACITOR, 100μF, 50V	C1	1	1		
143		800030	.01μF, 600V	C3	2	1		
144		800002	470pF, "	C4	1	1		
145		810060	35μF, 25V	C5	2	1		
146			S/A C5	C6				
147		100134	.05μF, 200V	C7	1	1		
148			S/A C3	C8				
149		100178	.1μF, 100V	C9	1	1		
151		821006	68μF, 15V	C11	1	1		
152		100063	10μF 25V	C12	1	1		
153		821007	68 μF "	C13	1	1		
155		100413	DIODE, IN4004	CR1	2	1		
156			S/A CR1	CR2				
157		720410	IN4741A	CR3	1	1		
158		100387	IN753A	CR4	1	1		
159		720167	IN5221B	CR5	1	1		
160		100413	IN4384	CR6	4	1		
161			S/A CR6	CR7				

REVISIONS
REV | DESCRIPTION

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT 52542
PLANNER	PREP DATE 10-23-75	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'Y		
MAT. DUE	APP'D	VPH 12-35 OV		
B/U REQ.		DRAWING NO.		
B/U COMP	USED ON	REF — SIZE P PART NO. T062200	REV	
		SHEET 5 OF 8		

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
		P D 0 2 5 0 0 6 (CONT)	ASS'Y., COMP. B D.		—	—		
63		1 0 0 3 7 8	DIODE, IN751A	CR8	2	1		
64		7 4 1 0 0 1	UN-SW 2N4990	CR9	1	1		
			S/A CR8	CR10				
66		7 2 0 4 4 0	IN 4148	CR11	1	1		
67			S/A CR6	CR12				
68				CR13				
70		0 2 5 7 5 6	I.C.	A1	1	1		
72		106587	TRANSISTOR, 2N 2219 A	Q1	1	1		
74		6 4 0 4 4 0	RESISTOR, 470Ω, 2W, 10%	R1	2	1		
75								
76		6 0 0 2 0 7	POT, 2K, ½W, 20%	R3	1	1		
77		6 2 0 4 3 6	2.26K, ½W, 1%	R4	1	1		
78		6 2 0 5 9 2	6.19K,	R5	1	1		
79		6 2 0 5 3 4	4.64K,	R6	1	1		
80		6 2 0 4 0 2	1.96K,	R7	1	1		
81		1 0 6 0 1 2	2.2Ω, 10%	R8	2	1		
84		6 0 0 0 4 6	POT, 100Ω, ½W, 20%	R11	4	1		
85		1 0 1 4 5 9	1.5K, ½W, 10%	R12	1	1		
86		1 0 1 4 6 7	1K,	R13	1	1		
87			S/A R8	R14				
88		6 3 0 4 5 0	2.5K, 3W, 3%	R15	1	1		
89			S/A R11	R16				
90		6 4 0 3 0 0	50Ω, 10W	R17	2	1		
91			S/A R17	R18				
92		6 4 0 2 9 0	50Ω, W, 5%	R19	1	1		
93		6 4 0 1 9 0	10Ω, 2W	R20	1	1		

REVISIONS

REV	DESCRIPTION

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT 52542
PLANNER	PREP DATE 10-23-75	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'Y		
MAT. DUE	APP'D	VPH 12-35 OV		
B/U REQ.		DRAWING NO.		
		REF —	SIZE P	PART NO. T062200
B/U COMP	USED ON	SHEET 6 OF 6		

FORM E8-A 11 JUL 75

ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
		PD025621 (CONT)	ASS'Y., COMP. BD.		—	—		
194			RESISTOR, S/A R11	R211				
195		101459	1.5K, ½W, 10%	R212	1	1		
196		101467	1K, ↓ ↓	R213	2	1		
197			S/A R11	R214				
198			↓ R1	R215				
199		611100	2.2MΩ, ½W, 10%	R216	1	1		
200		101511	4.7K, ½W, 10%	R217	2	1		
201		101510	6.8K, ↓ ↓	R218	1	1		
202			S/A R23	R219				
203		101667	220Ω, ½W, 10%	R230	1	1		
204			↓ S/A R27	R231				
206		840422	PAD, IC		1	R		
207		840411	, TRANSISTOR		1	R		
208		840420	↓ , ↓		1	R		
210	A		WIRING, T101 & L101	PD025613	REF	—		
212	A		, REAR CHASSIS	PD025610	REF	—		
214	A		, FRONT PANEL	PD025627	REF	—		
216	A		, PCB	PD025615	REF	—		
218	A		, HEAT SINK	PD025619	REF	—		
219	B		, ↓	PD025623	REF	—		
220	B		↓ , CHASSIS	PD025626	REF	—		
					1			
					1			
					1			

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT 52542
PLANNER	PREP DATE 10-24-75	SYSTRON DONNER CORPORATION		
	CHK'D	SHIPPING ASS'Y		
MAT. DUE	APP'D	VPH 12-35 OV		
B/U REQ.		DRAWING NO. REF — SIZE P PART NO. T062200 REV		
B/U COMP	USED ON	SHEET 7 OF 8		

REVISIONS
REV | DESCRIPTION

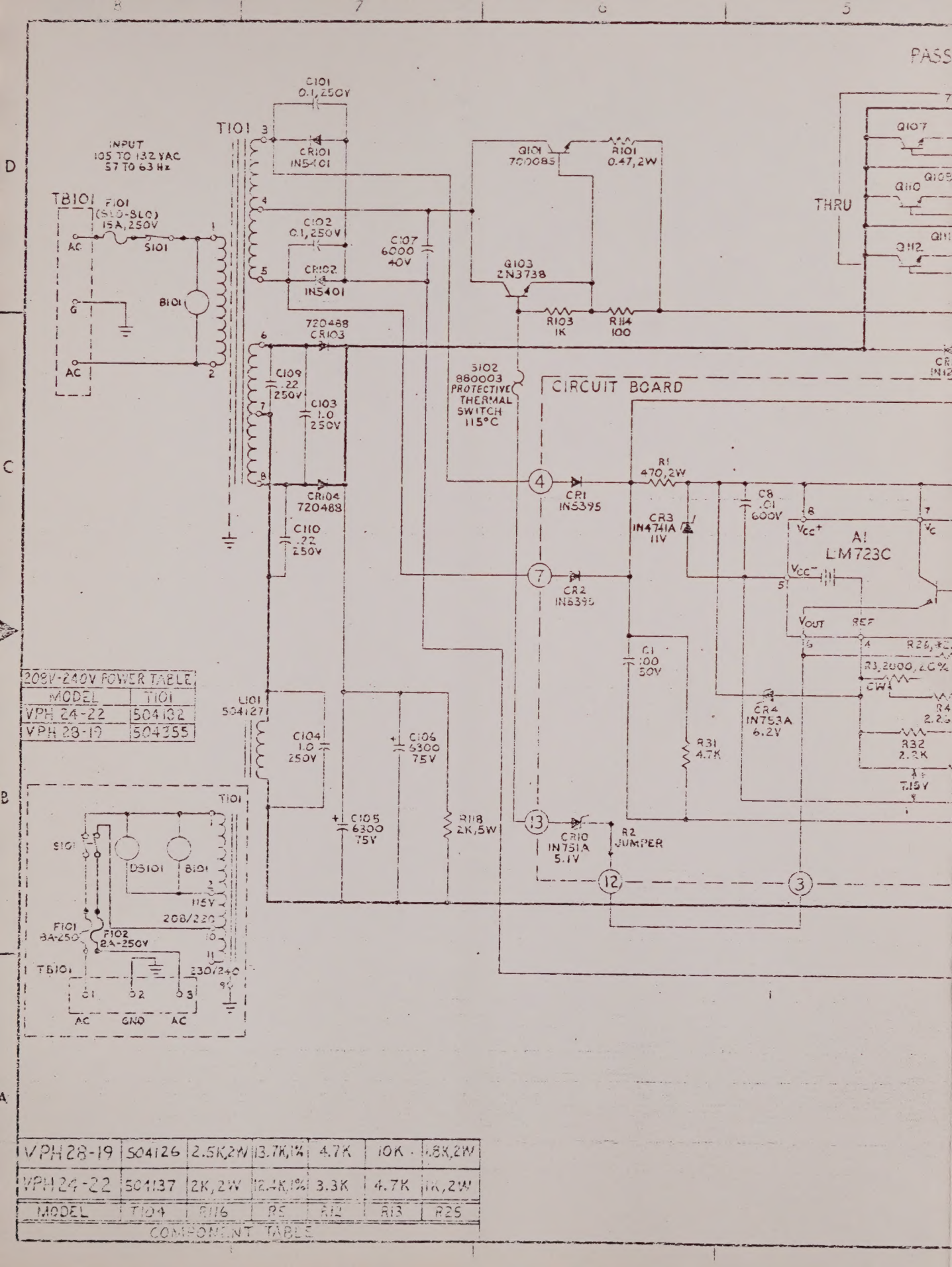
ITEM NO.	SIZE	PART NUMBER	DESCRIPTION	REFERENCE NO.	ASSY QTY	ACT. CODE	ISS. QTY	SHT QTY
		T062200 (CONT)	SHIPPING ASSY		—	—		
227		PD024991 01	#HARNESS AC/DC		1	2		
228		PD024991	WIRE LIST		1	2		
229		T960565	SPADE LUG		5	R		
230		T960560	↓		3	R		
231		PD027090 01	#HARNESS DC		1	2		
233		PD027090	WIRE LIST		1	2		
235		PD002502 2	WIRE LIST - JUMPERS		1	2		
237		T960515	SPADE LUG		4	R		
238		T960514			2	R		
239		T960160			2	R		
240		T960565	↓		2	R		
243		065166 01	METER ASSY 0-50A	M101	1	2		
244		065160	METER MVMT 1ma 77Ω	M101	1	1		
245		117397	DIAL, BLANK	B 065166	1	1		
246		065170 02	METER ASSY 0-20V	M102	1	2		
247		065160	METER MVMT 1ma 77Ω		1	1		
248		117397	DIAL, BLANK	B 065170	1	1		
249		065049	P.C. BOARD		1	1		
256		117123	POT 1T WW 2K 1%	R401	1	1	73XL	R
251		117126	RES, 19.1K 1%	R402	1	1	91637	
252		103862	HEX NUT 73734	90Ch	2	1		

REVISIONS DESCRIPTION

REV

MODEL	JOB NO.	LOT QTY	LOT NO.	CODE IDENT 52542
PLANNER	PREP DATE	SYSTRON DONNER CORPORATION	
	CHK'D	SHIPPING ASSY	
MAT. DUE	APP'D	VPH 12-35 0V	
B/U REQ.		DRAWING NO. REF — SIZE P PART NO. T062200 REV	
B/U COMP	USED ON	SHEET 8 OF 8	

FORM E8-A 11 JUL 75



208V-240V POWER TABLE	
MODEL	T101
VPH 24-22	504132
VPH 28-19	504355

MODEL	T104	R116	R5	R12	R13	R25
VPH 28-19	504126	2.5K, 2W	13.7K, 1%	4.7K	10K	6.8K, 2W
VPH 24-22	504137	2K, 2W	12.4K, 1%	3.3K	4.7K	1K, 2W

COMPONENT TABLE

TRANSISTORS

REVISION			
D	REDRAWN FROM 'E' SIZE		6/30 RB
E	CHANGED S101 TO A DPST, ADDED F102	15171	9/90 RB

NOTES:
1) UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE ½W, ±5%
RESISTANCE VALUES ARE IN OHMS
CAPACITANCE VALUES ARE IN MICROFARADS
2) ALL MODELS ARE SHOWN WITH
OVER VOLTAGE PROTECTION
TO DELETE, OMIT CR106, R19 THRU R23, C7, C9, CR9
3) * DENOTES SELECT AT TEST

R104 0.1,3%, 5W
R107
R108
R110
R111
R112
R115 10, 2W
CR109 1N5395
THRU

R117 .0033 AMMETER SHUNT
TB102
+V
-V
M101 30A
M102

R14 2.2
R16 100, 20%
R11 100, 20%
CURRENT LIMIT ADJUST R12*
R30 220
CR5 1N758A 10A
R13
C11 68-15V
R28 6.8K
Q1 2N2219A
C3 .01 600V
CR12 1N 5395
R19 200, 5W
R22 1.5K
R24 100 20% CW
R15 2.5K 3W
C4 47077
R8 2.2
R29 1K
R27 4.7K
R18 250 10W
R17 250 10W
R20 47 2W
CR11 1N5395
CR13 1N5395
R5
C10 2-50V
CR9 2N4990
C7 .05 200V
R23 1K
C9 0.1 100V
CR106 C22BF
C103 6300 75V
CR107 1N1200A
R7 1.9K, 1%
2.2V
CR6 1N5395
C13 50 50V
CW R21 100 20%
CR7 1N5395
R25
C5 35-25V
C6 35-25V
LED
DS101 DC ON
CW R116 VOLTAGE ADJUST
TB103
+V +S RVP -S -V
R402 CW
R401

ITEM NO.	QTY	PART NUMBER	DESCRIPTION	SCHEMATIC REF NO

LIST OF MATERIALS

PROPRIETARY DATA

		DRAWN RB 6/90	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DECIMAL TOLERANCE X ±.XX ±.XXX ANGLES ±	SYSTRON DONNER CORPORATION CONCORD CALIFORNIA
		ENGR		CODE IDENT 52542
		MECH		
		PROJECT		
		QA		
VPH28-19				
VPH24-22				
REVISION	NEXT ASSY			
APPLICATION				

SCHEMATIC VPH

DRAWING NO. 10 124820 E